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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain



VOLUME 28 Number 1

March 2006

ISSN 0331-3689

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

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Altitudinal distribution of birds in Mukowa primary forest, Irangi area, eastern Democratic Republic of Congo

by Robert Byamana Kizungu

Makerere University Institute of Environment and Natural Resources,
Organisation of Biodiversity Information and Conservation in Congo-Kinshasa, and
Centre de Recherche en Sciences Naturelles de Lwiro, Laboratoire d'Ornithologie,
DS/ Bukavu, Sud-Kivu, République Démocratique du Congo
<robertkizungu@yahoo.fr>

Received 9 May 2005; revised 5 January 2006.

Summary

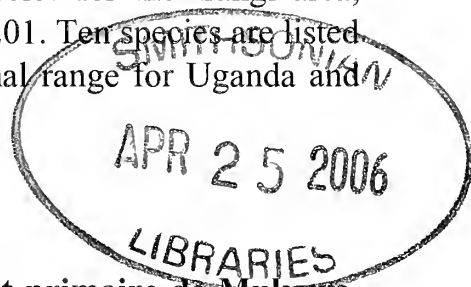
In three adjacent 100 m altitude bands, from 800 to 1100 m, in Mukowa primary forest, Irangi area, I recorded 21 new species for the Irangi area, bringing the number of bird species known there to 201. Ten species are listed that were encountered outside their known altitudinal range for Uganda and Congo Democratic Republic.

Resumé

Distribution altitudinale des oiseaux dans la forêt primaire de Mukowa, milieu d'Irangi, est de la République Démocratique du Congo. Dans trois adjacentes bandes altitudinales de 100 m, entre 800 m et 1100 m dans la forêt primaire de Mukowa, localité d'Irangi, j'ai identifié 21 nouvelles espèces pour la région d'Irangi. Ceci ramène le nombre d'espèces d'oiseaux connues dans cette localité à 201 espèces. Dix espèces sont listées en dehors des limites altitudinales connues de l'Uganda et de la République Démocratique du Congo.

Introduction

Mukowa primary forest is a part of Irangi Forest, which is described by Kizungu (2001). It belongs to the Albertine Rift Sub-Region. The status of birds along the Albertine Rift is not well known (Dowsett 1985, Prigogine 1985, Collar & Stuart 1988) and the patterns of distribution have not been related to environmental factors. Work on Irangi birds has comprised surveys in the forests and savanna (Wilson & Catsis 1990, Kizungu 1996, Kizungu & Beyers 1994, Kizungu *et al.* 1998, Kizungu



2001) rather than ecological study. In this paper I investigate the altitudinal range of the bird species found in the Irangi area at higher altitudes than in Kizungu (2001).

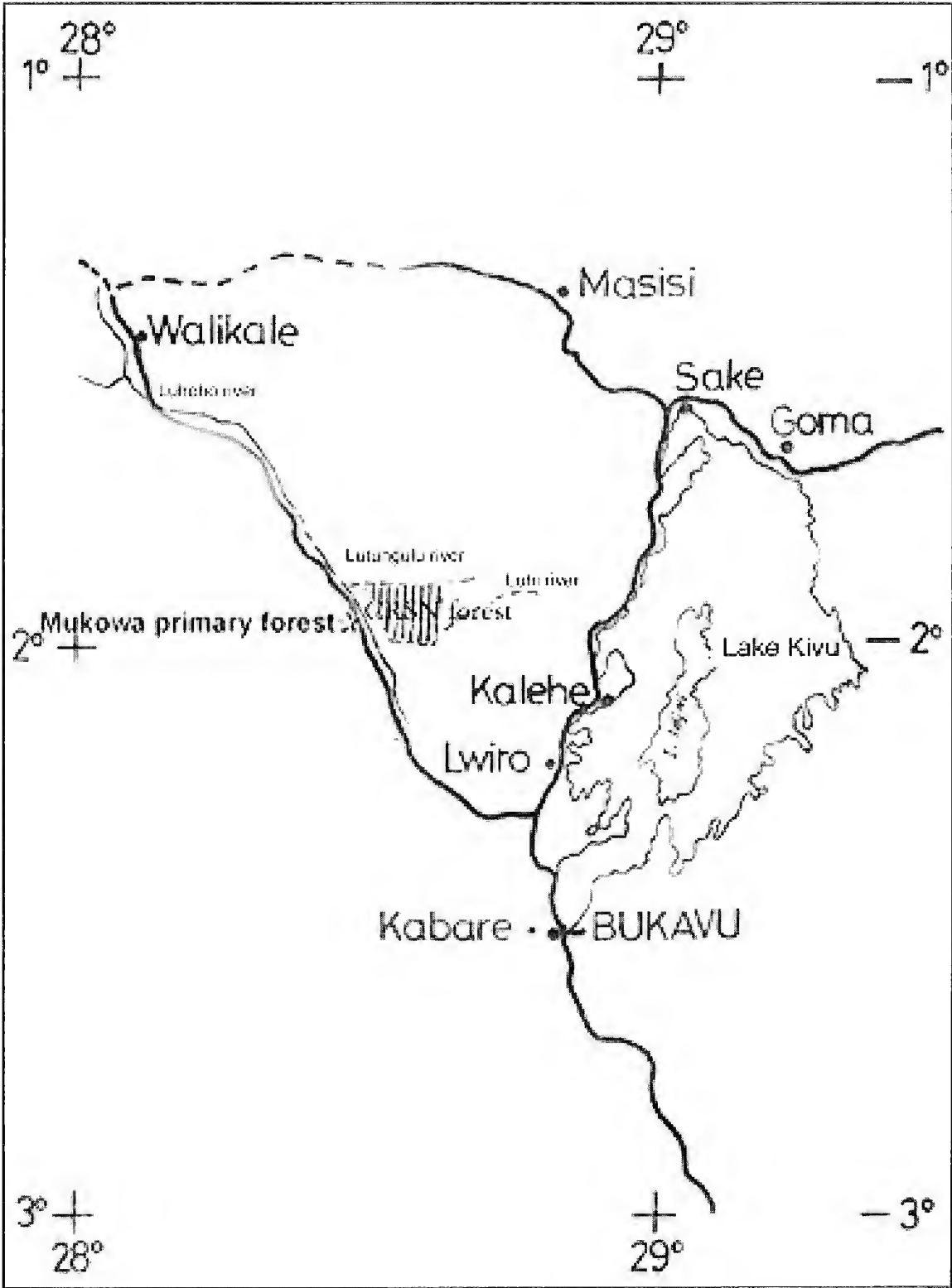


Figure 1. Mukowa primary forest on the west side of the Bukavu–Walikale–Kisangani road, opposite the CRSN forest reserve.

Mukowa primary forest (altitude 830–1100 m, 1°53'S, 28°27'E) is a private forest situated 108 km NNE of Bukavu on the west side of the Bukavu-Walikale road, between Bunyakiri and Hombo (Fig. 1). Mukowa is a *c.* 4 km² fragment of primary forest which forms part of the Centre de Recherche en Sciences Naturelles forest reserve of *c.* 15 km². The forest fragmentation is due to the increasing human population, most settlements being at the foot of hills where people can find water from rivers and farm. New areas of land are being claimed and large trees felled for building and farming. Smaller trees are cut for firewood and bushes cleared.

I chose a hill which was both accessible (many areas being unsafe due to war in the region) and where I could find at least three altitudinal bands of at least 100 m width, which might produce avifaunal differences as proposed by Prigogine (1980). The slope in Irangi Forest goes from 700 m in the east (near the main Bukavu-Walikale road) to 1500m in the west (away from the main road in the deeper forest). Three altitudinal bands were studied: 800–900 m (1°53'4''S, 28°26'49''E); 900–1000 m (1°53'12''S, 28°26'59''E); 1000–1100 m (1°53'24''S, 28°27'4''E). A 102-m transect line comprising seven 12-m mist-nets and three 6-m nets was oriented N–S in each altitudinal band while a 1-km transect line of point counts was set E–W across the altitudinal range (from lower to higher altitude). Four months of field work were carried out: Dec 2002, Jan 2003, Mar 2003 and in Sep–Oct 2003. Nets were opened from dawn to 16h00 for four net-days, when they were moved to the next altitude band. Identifications of captured birds were made with reference to Urban *et al.* (1997), Stevenson & Fanshawe (2002) and Perlo (1995).

Point counts followed the protocol of Kanyamibwa (1992) and Bibby *et al.* (1998). Using a pedometer, I walked 1 km on a trail from east to west. Six points were established at 200m intervals along the transect, where I stopped for 14 min. For the last 10 min. of the 14, I identified birds seen or heard within an estimated radius of 25 m of the point, and additional birds (mostly heard) beyond 25 m. Eighteen points were counted in Dec 2002, 18 in Jan 2003, six in Mar 2003 and 72 in Sep–Oct 2003: a total of 114 points.

I also relied heavily on general observation including tape recording and playback, and I devoted most of my time between net checks looking for species along the trails and along the forest edge, trying to make sure that I had covered all of the habitat available.

Results

A total of 1024 individuals of 71 species were inventoried during four months of fieldwork, of which 225 individuals were captured and 799 observed at point counts. The lowest altitude band (800–900 m) produced the highest number of both species and individuals netted while 900–1000 m had the highest number of both species and individuals recorded from point counts. Table 1 includes only species recorded outside the altitudinal range given for Congo Democratic Republic (Prigogine 1975,

1980) and Uganda (or E Africa generally) (Stevenson & Fanshawe 2002), as well as species not yet recorded for Irangi (Wilson & Catsis 1990, Kizungu & Beyers 1994, Kizungu 1996, 2001).

Table 1. New species (¹) or new altitudinal records (²) at Mukowa forest. Numbers are birds seen or heard and (in parentheses) netted.

	800–900	900–1000	1000–1100
Anatidae			
<i>Pteronetta hartlaubi</i> Hartlaub's Duck ²	7		
Accipitridae			
<i>Urotriopsis macrourus</i> Long-tailed Hawk ^{1,2}		3	
Columbidae			
<i>Turtur brehmeri</i> Blue-headed Wood Dove ¹		(2)	
<i>Streptopelia capicola</i> Ring-necked Dove ¹		1	
Trogonidae			
<i>Apaloderma narina</i> Narina's Trogon ¹		2	3
Alcedinidae			
<i>Alcedo leucogaster</i> White-bellied Kingfisher ¹	4(4)	3(1)	2
Bucerotidae			
<i>Tropicranus albocristatus</i> White-crested Hornbill ²	1	2	3
<i>Bycanistes cylindricus</i> White-thighed Hornbill ²	3	3	1
<i>Ceratogymna atrata</i> Black-casqued Walled Hornbill ²	8	9	8
Picidae			
<i>Sasia africana</i> African Piculet ²	(1)		(1)
<i>Campethera nivosa</i> Buff-spotted Woodpecker ¹	(1)		(1)
<i>Picoides obsoletus</i> Brown-backed Woodpecker ¹		2	
Pycnonotidae			
<i>Phyllastrephus icterinus</i> Icterine Greenbul ¹	4(2)	(3)	(2)
<i>Phyllastrephus xavieri</i> Xavier's Greenbul ¹	(1)		(4)
<i>Criniger chloronotus</i> Eastern Bearded Greenbul ²	1(1)		
Turdidae			
<i>Stiphronis erythrothorax</i> Forest Robin ¹	(1)	(1)	(1)
<i>Alethe poliocephala</i> Brown-chested Alethe ¹			(1)
<i>A. diademata</i> Fire-crested Alethe ¹	(3)	(2)	1(3)
<i>Neocossyphus poensis</i> White-tailed Ant Thrush ¹	(1)	(2)	
<i>N. rufus</i> Red-tailed Ant Thrush ¹	3(2)	6(1)	2
Sylviidae			
<i>Sylvietta brachyura</i> Northern Crombec ¹	1		
<i>Apalis cinerea</i> Grey Apalis ¹		(1)	
Muscicapidae			
<i>Muscicapa olivascens</i> Olivaceous Flycatcher ^{1,2}	(1)		

	800–900	900–1000	1000–1100
Monarchidae			
<i>Terpsiphone bedfordi</i> Bedford's Paradise Flycatcher ²	15(7)	19(4)	12(1)
Malaconotidae			
<i>Nicator vireo</i> Yellow-throated Nicator ¹	(1)		
Ploceidae			
<i>Malimbus coronatus</i> Red-crowned Malimbe ²		3	1
Estrildidae			
<i>Nigrita bicolor</i> Chestnut-breasted Negrofinch ¹	(1)		
<i>Parmoptila woodhousei</i> Woodhouse's Antpecker ¹	1(2)	(2)	
<i>Mandingoa nitidula</i> Green-backed Twinspot ¹		(1)	

Discussion

Twenty-one species had not been included by Wilson & Catsis (1990), Kizungu (1996, 2001) or Kizungu & Beyers (1994), bringing the number of bird species now known in the Irangi area to 201. Some species might have a restricted altitudinal range as indicated in the table.

Acknowledgments

Sincere thanks go to Prof. Derek Pomeroy of Makerere University Institute of Environment and Natural Resources and Dr Christine Dranzoa of WARM who supervised this study. I thank the John and Catherine MacArthur Foundation, Chicago, the Royal Society for Protection of Birds, U.K. and the Wildlife Conservation Society, Uganda, which supported the project through MUIENR. I also thank Dr John Bates for reviewing the manuscript and supporting me through the *Programme Biodiversité des Ecosystèmes Aquatiques et Terrestres dans le Rift Albertin*. Many thanks to my field technicians Kodioko, Kalusha, Mutangi, Bahati, Bavurha Parfait and Cirimwami who assisted me collecting data.

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Dénombrements d'oiseaux d'eau dans le delta intérieur du Niger (Mali) en janvier 1999, 2000 et 2001

par O. Girard¹, J. Thal² & B. Niagaté³

¹Office National de la Chasse et de la Faune Sauvage/CNERA Avifaune migratrice, Chanteloup, F-85340 L'Île d'Olonne, France <o.girard@oncfs.gouv.fr>

²10 rue Bichat, F-51000 Chalons-en-Champagne, France

³Direction Nationale de la Conservation de la Nature/DAFPR, BP 275, Bamako, Mali

Reçu 17 février 2005; revu 26 août 2005.

Résumé

Nous avons réalisé des dénombrements aériens sur la quasi-totalité du Delta intérieur du Niger, au Mali, en janvier 1999, 2000 et 2001. Leurs résultats permettent pour un certain nombre d'espèces d'Ardeidae, d'Anatidae et de limicoles d'actualiser les estimations d'effectifs présents à cette période. Pour une vingtaine d'entre elles, les effectifs estimés au cours de ces trois années, et particulièrement en 2000 et 2001, sont les plus importants ou parmi les plus importants enregistrés depuis c. 30 années. Dans le même temps, le déclin de quelques espèces semble patent.

Summary

Waterbird counts in the inner Niger delta (Mali) in January 1999, 2000 and 2001. We carried out aerial counts over almost the entire inner Niger delta in Mali, in January 1999, 2000 and 2001. Results permit, for several Ardeidae, Anatidae and waders, revision of the estimated populations present in this period. For some 20 species, the estimates over the three years, and especially in 2000 and 2001, are the highest or among the highest registered for c. 30 years. However, declines of some species are noted.

Introduction

Depuis 1972, des dénombrements d'oiseaux d'eau ont été réalisés dans le delta intérieur du Niger, au Mali. Ils ont été effectués de façon très irrégulière et avec une couverture géographique fort variable. Ces dénombrements ont montré l'importance de cette zone humide, la plus importante du Mali et l'une des zones humides majeures de l'Afrique de l'Ouest avec le bassin du Sénégal et le bassin du lac Tchad. A la fin des années 1980, jusqu'à 1,5 million d'oiseaux y ont été recensés.

Durant les années 1990, les dénombrements n'ont été que partiels. En janvier 1999, 2000 et 2001, trois missions de comptages ont été de nouveau entreprises afin de confirmer l'importance de cette zone et d'évaluer les effectifs actuellement présents. Ce sont les résultats obtenus au cours de ces trois missions que nous présentons et comparons succinctement à ceux obtenus antérieurement.

Ces comptages effectués dans des conditions d'inondation assez similaires et selon le même protocole, démontrent l'importance de couvrir l'ensemble de la zone pour appréhender au mieux les effectifs présents, compte tenu des grandes variations inter-annuelles dans la répartition des oiseaux. Toute extrapolation à partir de quelques secteurs échantillons ne pourrait être fiable. Pour nombre d'espèces, l'interprétation des résultats des comptages réalisés dans le delta intérieur du Niger requiert de connaître simultanément les effectifs présents dans au moins les deux autres grands ensembles subsahariens: le delta du Sénégal et le bassin du lac Tchad.

Description de la zone et méthode de comptage

Une grande partie de la moitié sud du Mali est traversée par le fleuve Niger. Prenant sa source en Guinée, le fleuve Niger entre au Mali par le sud-ouest du pays et se dirige vers le nord-est sur quelque 1000 km, jusqu'à Tombouctou, au bord du Sahara. Il décrit ensuite une grande courbe pour repartir vers le sud-est, traversant le Niger et le Nigeria avant de se jeter dans l'Océan Atlantique.

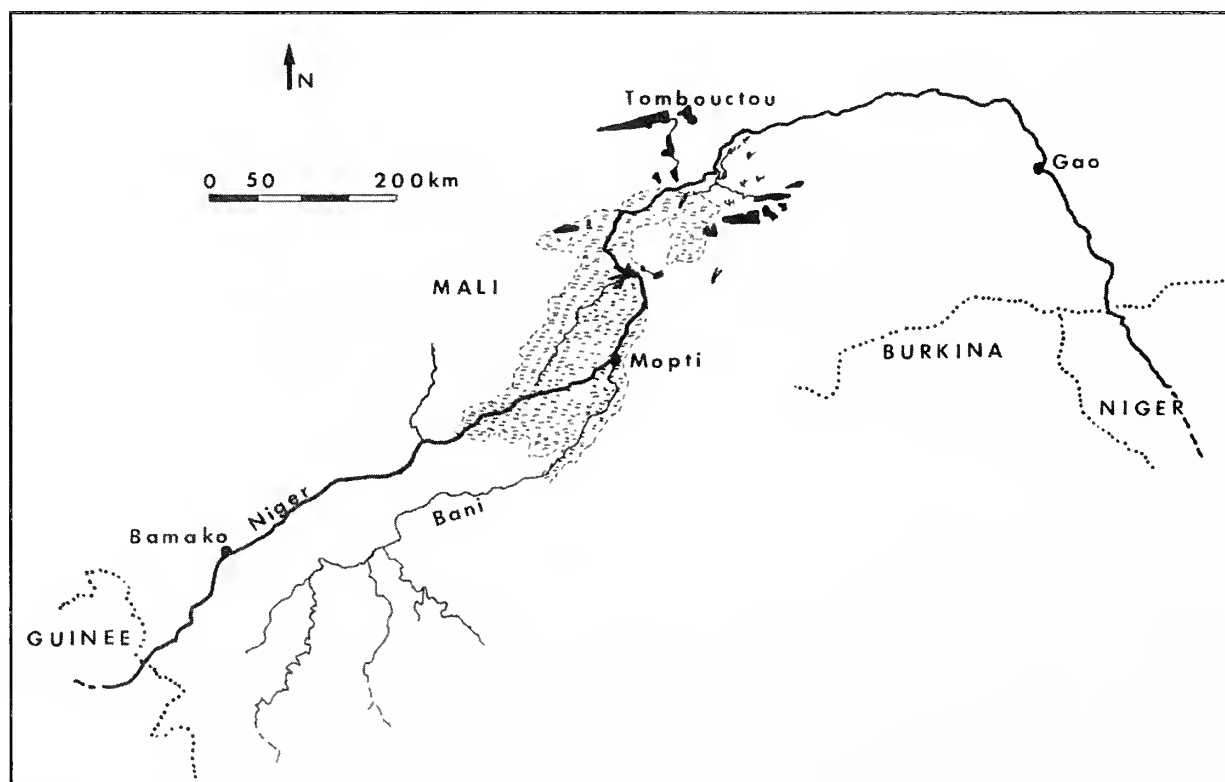


Figure 1. Le fleuve Niger au Mali et le delta intérieur du Niger.

Au Sud de Tombouctou, le fleuve Niger traverse une très vaste plaine quasiment sans relief qu'il inonde plus ou moins lors de crues annuelles initiées par les pluies tombant entre mai et septembre en Guinée et au Mali, aidé par l'un de ses principaux affluents, le Bani. Cette zone d'inondation, appelée delta intérieur du Niger (DIN) s'étend sur c. 425 km de long et 90 km de large, couvrant c. 35000 km² (Fig. 1).

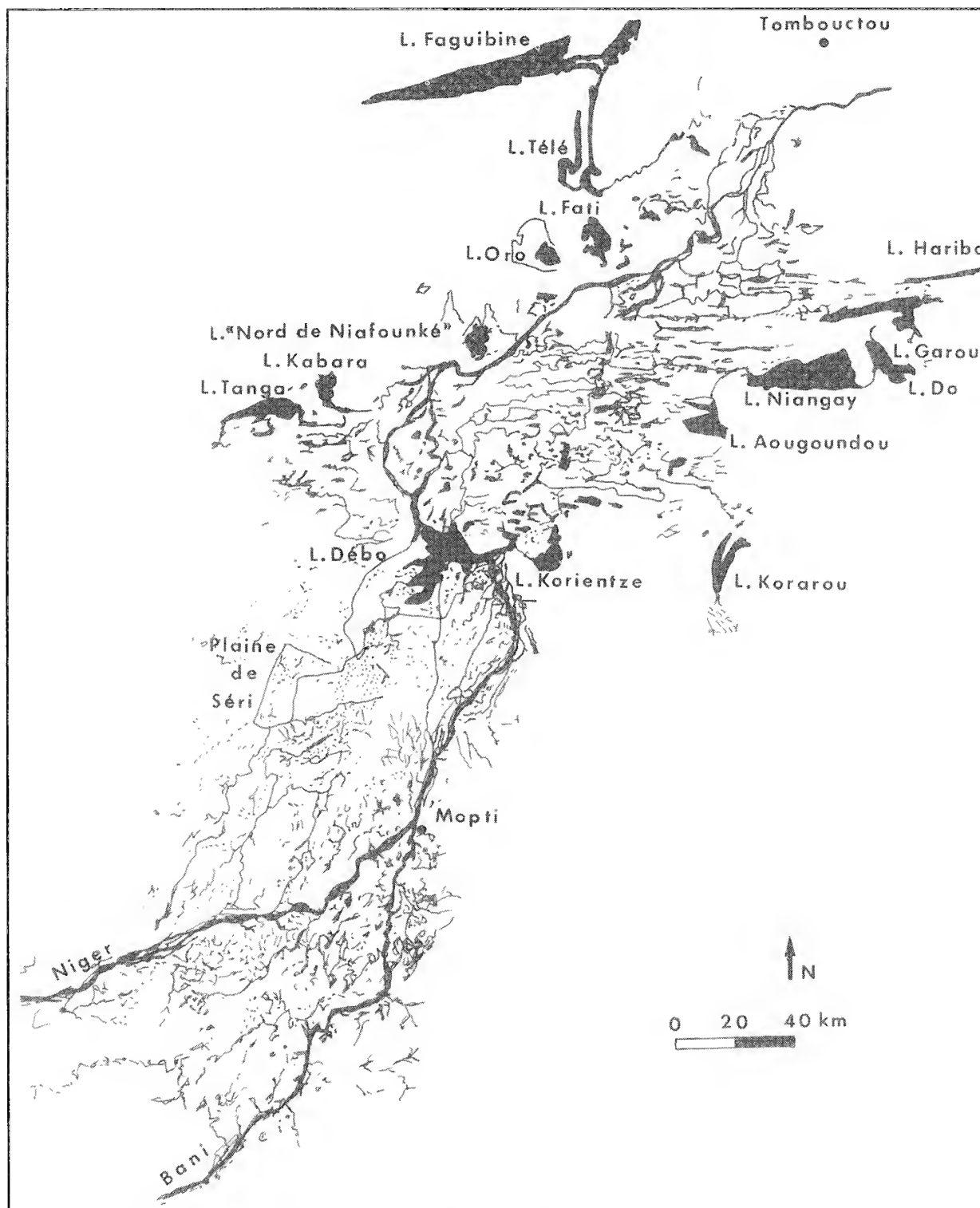


Figure 2. Les principaux lacs, mares et marigots du delta intérieur du Niger.

En raison de la très faible déclivité du delta (c. 8 m en 400 km), la vitesse de progression de l'inondation est très lente. Ainsi la crue, maximale à Bamako en sep–oct, n'arrive qu'en octobre à Mopti, en décembre à Tombouctou et n'atteint Gao qu'en janvier. De même, la progression de l'inondation perpendiculairement au fleuve est très lente; les grands lacs situés à l'est et à l'ouest du delta ne sont remplis que plusieurs semaines après le passage de la crête de crue.

En fonction de la hauteur des précipitations en Guinée et au Mali, la crue du fleuve Niger est plus ou moins importante et la zone d'inondation plus ou moins étendue: la superficie inondée varie de 8000 à 23000 km², voire plus (Mariko *et al* 2003). Plus de la moitié du DIN peut donc être submergée (Fig. 2). Le nombre de mares et marigots, et le niveau d'eau des principaux lacs, fluctuent ainsi fortement.

La seule méthode qui permette de couvrir presque exhaustivement une zone aussi vaste et inaccessible que le DIN en un temps relativement court est le comptage aérien. Deux appareils furent utilisés: un Cessna[®] 172, monomoteur à ailes hautes particulièrement bien adapté à ce genre de travail (en 1999 et 2000) et un Piper[®] PA 32, monomoteur à ailes basses, plus puissant et plus rapide que le Cessna (en 2001). Le trajet exact de l'avion ainsi que les coordonnées géographiques (relevées grâce à un GPS), l'heure et l'estimation de la taille des groupes (avec identification spécifique des différentes espèces d'oiseaux d'eau observées) étaient systématiquement relevées. L'identification spécifique des différents oiseaux d'eau observés était réalisée dans la mesure du possible. Certaines espèces ne sont pas prises en compte et d'autres ne sont que partiellement estimées. Il s'agit principalement des limicoles de petite taille, des espèces pas ou peu repérables d'avion (petits ardéidés), de celles en cours de nidification et que nous n'avons pas voulu déranger (ardéidés) et de celles dont la détermination est impossible d'avion (certains laridés notamment). Les comptages furent réalisés en c. 50 h en 1999 (18–27 jan) ainsi qu'en 2000 (18–23 jan) et en c. 40 h en 2001 (13–18 jan), l'avion étant plus rapide.

Au cours de ces trois missions, l'état d'inondation du delta a quelque peu varié, le maximum de secteurs inondés étant observé en jan 2000 et le minimum en jan 2001. L'inondation en jan 1999 était un peu inférieure à celle de 2000. Par rapport aux dernières décennies, les hauteurs de crues enregistrées au cours des trois périodes d'étude se situent dans des valeurs moyennes.

L'état de remplissage et les conditions de dénombrements des différents lacs ont parfois varié. Le lac Faguibine était en cours de remplissage lors des trois missions. Seule la partie est du lac était en eau. Ce lac était particulièrement difficile et dangereux à compter en raison de très fortes turbulences créées par les collines situées juste à l'est. Les lacs Télé, Oro, Fati, Tanda, Kabara, Aougoundou, Korientze et Débo étaient en eau; à l'exception du lac Télé où de très fortes turbulences, dues aux collines situées sur le côté est, nous ont contraint à rester assez haut (c. 130 m) en 2001, tous ces lacs ont été dénombrés dans de bonnes conditions. Le lac "Nord de Niafounké" était également en eau. Il n'a pas pu être compté en 1999, a été couvert dans des conditions médiocres en 2000 et bien dénombré en 2001. Au cours des trois

années, les lacs Niangay et Do étaient en cours de remplissage (le lac Do était à sec en 2001) et les conditions de dénombrement furent bonnes. Le lac Korarou n'a pas été survolé en 1999. Il était plein en 2000, les conditions de survol étant bonnes, et complètement à sec en 2001. Enfin les lacs Haribono et Garou ont toujours été à sec.

En dehors de ces lacs, la partie du DIN située au nord du lac Débo se caractérise par un enchevêtrement dense de marigots et de dépressions généralement en eau, avec quelques vastes plaines inondées, parfois utilisées pour le maraîchage (principalement dans le nord de la zone). Outre les plus grands lacs, ce sont près de 200 mares, reliées entre elles par des dizaines de marigots, qui sont potentiellement aptes à accueillir des oiseaux d'eau. La partie du DIN située au sud du lac Débo se caractérise par un nombre beaucoup plus important de petites dépressions potentiellement inondables (c. 750). En dehors de la plaine de Séri, vaste plaine d'inondation (c. 400 km²) de la rivière Diaka, cette partie du delta était très aride en janvier. Les dépressions en eau sont très souvent isolées et les marigots en cours d'assèchement. Excepté pour quelques espèces, cette partie du delta apparaît moins favorable aux oiseaux d'eau.

Résultats et discussion

Au cours de ces trois séjours, c. 50 espèces ont été recensées d'avion, totalisant environ 520 000 (1999), 985 000 (2000) et 1 365 000 (2001) individus. Nous ne présenterons ci-dessous que les espèces d'oiseaux d'eau (hors rapaces et passereaux) pour lesquelles les données obtenues sont significatives ou présentent un certain intérêt par rapport aux données publiées antérieurement, principalement dans les synthèses de Perennou (1991, 1992), Taylor & Rose (1994), Dodman & Taylor (1995, 1996), Dodman *et al.* (1997, 1999), ou les études de Kamp & Diallo (1999) et Wymenga *et al.* (2002).

Pelecanidae

Pelecanus onocrotalus Pélican blanc. Seulement 167 ont été observés en janvier 1999, dans trois secteurs. Aucun oiseau n'a été vu en 2000 et 2001. Cette espèce fréquente le DIN lors de la décrue. Les pélicans apparaissent donc généralement en mars, les effectifs étant maximaux en avril et mai (Wymenga *et al.* 2002).

Phalacrocoracidae

Phalacrocorax africanus Cormoran africain. Régulièrement observé (Tableau 1), parfois en bandes de plusieurs dizaines pêchant ensemble sur les marigots. Bien que les cormorans fréquentent l'ensemble du delta, la majorité est observée dans la partie centrale, autour des lacs Débo et Korientze, et sur les rivières Niger, Bani et Diaka. Les effectifs recensés en janvier correspondent aux estimations données par Kamp & Diallo (1999). A cette époque de l'année, les oiseaux sont sur les colonies de reproduction et ne sont donc pas pris en compte lors des recensements. L'estimation du nombre présent en fin de période de reproduction est de 60000 oiseaux (Wymenga *et al.* 2002). Le Mali accueille certaines années plus de 75% des oiseaux ouest-africains (Dodman & Diagana 2003).

Tableau 1. Effectifs de quelques espèces de Phalacrocoracidae, Anhingidae, Ardeidae, Ciconiidae et Threskiornithidae dénombrés dans le delta intérieur du Niger en janvier 1999, 2000 et 2001.

	1999	2000	2001
<i>Phalacrocorax africanus</i> Cormoran africain	2700	4520	5835
<i>Anhinga rufa</i> Anhinga roux	23	85	2583
<i>Nycticorax nycticorax</i> Bihoreau gris	350	55	19
<i>Ardeola ralloides</i> Héron crabier	2900	6250	12360
<i>Bubulcus ibis</i> Héron garde-boeufs	27000	65325	43400
<i>Egretta garzetta</i> Aigrette garzette	8200	3900	10360
<i>E. alba</i> Grande Aigrette	3000	3150	4370
<i>E. alba/intermedia</i> Grande Aigrette ou Aigrette intermédiaire	9000	14880	10100
<i>A. purpurea</i> Héron pourpre	917	1813	1683
<i>Ardea cinerea</i> Héron cendré	8000	7000	6210
<i>Ciconia ciconia</i> Cigogne blanche	516	3657	883
<i>Plegadis falcinellus</i> Ibis falcinelle	3300	3520	6150
<i>Threskiornis aethiopica</i> Ibis sacré	91	16	24
<i>Platalea alba</i> Spatule d'Afrique	38	12	8

Anhingidae

Anhinga rufa Anhinga roux. Concentré dans la partie sud du Débo, l'effectif le plus important est observé en 2001 (Tableau 1). Il est trois fois plus importante que l'estimation retenue par Wymenga *et al.* (2002). Le Mali accueille certaines années plus de 75% des oiseaux ouest-africains (Dodman & Diagana 2003).

Ardeidae

Le Héron strié *Butorides striatus*, le Héron mélanocéphale *Ardea melanocephala*, l'Aigrette ardoisée *Egretta ardesiaca* et l'Aigrette des récifs *E. gularis*, observés lors de prospections terrestres, n'ont été vus, ou identifiés, que de façon tout à fait accidentelle d'avion. Aucun Héron goliath *A. goliath* n'a été observé dans le delta à cette période; l'espèce a été vue en avril 1998, lors de prospections terrestres.

Nycticorax nycticorax Bihoreau gris. Cachés dans la végétation durant la journée, sont peu observés durant ces comptages aériens (Tableau 1). Cependant, à cette époque de l'année, plusieurs milliers ont été dénombrés au crépuscule (Wymenga *et al.* 2002).

Ardeola ralloides Héron crabier. L'effectif de 12 360 atteint en 2001 (Tableau 1) et la discrétion de l'espèce permettent d'envisager que ce sont plus de 20000 oiseaux qui fréquentent le delta à cette période de l'année.

Bubulcus ibis Héron garde-bœufs. C'est l'espèce dominante (Tableau 1), omniprésente sur le delta, aussi bien dans les secteurs inondés que dans ceux asséchés. Compte tenu de la dispersion de cette espèce et des effectifs recensés, la population totale dans le delta est d'au moins 200 000 oiseaux, voire peut-être beaucoup plus.

Egretta garzetta Aigrette garzette, *E. alba* Grande Aigrette, *E. intermedia* Aigrette intermédiaire. Les deux dernières espèces ne sont habituellement pas différenciables d'avion. Le total varie selon les années de 20000–25000 individus (Tableau 1); l'effectif réellement présent dans le delta doit certainement être de l'ordre de 30000 oiseaux, soit nettement plus important que celui suggéré par Kamp & Diallo (1999).

Ardea purpurea Héron pourpré. Espèce difficile à repérer d'avion, elle semble présente essentiellement dans la région du lac Débo. Les effectifs réels (Tableau 1) sont très fortement sous-estimés lors des dénombrements. Sur l'ensemble du delta, les effectifs réellement présents doivent être de 5000–10000.

Ardea cinerea Héron cendré. Les effectifs dénombrés (Tableau 1) permettent d'envisager un effectif supérieur à 10000. Les maxima enregistrés jusqu'alors n'étaient que de 4000 oiseaux pour la partie centrale du DIN (Kamp & Diallo 1999).

Scopidae

Scopus umbretta Ombrette du Sénégal. Observée assez régulièrement lors des prospections terrestres (au bord des petites mares périphériques au DIN) mais n'a quasiment jamais été repérée d'avion.

Ciconiidae

Mycteria ibis Tantale ibis. Seulement 22 notés, en 1999. Guère noté à cette période de l'année (Kamp & Diallo 1999).

Ciconia nigra Cigogne noire. Une seule observation, de huit individus en 2000. L'espèce est anecdotique au Mali (Girard & Thal 2005) et en Afrique de l'Ouest (Brown *et al.* 1982, Bie & Morgan 1989, Lamarche 1980).

C. ciconia Cigogne blanche. L'espèce peut fréquenter des secteurs secs loin des zones humides prospectées et échapper facilement à l'observation. Les plus importantes concentrations ont été observées sur les lacs de la partie est du Delta, des bandes de plusieurs dizaines d'oiseaux pouvant cependant être observées n'importe où ailleurs dans le Delta. Les effectifs recensés varient fortement selon les années (Tableau 1). Kamp & Diallo (1999) ne retiennent que 500–1000 présents en janvier au sud du complexe Débo. L'importance du Mali pour cette espèce est primordiale: en 1999 et 2000, c. 90 % des oiseaux ouest-africains ont été dénombrés sur seulement une douzaine de secteurs du delta (Dodman & Diagana 2003).

Leptoptilos crumeniferus Marabout d'Afrique. Un seul vu, en 2000 (cinq avaient été observés en avril 1998). Guère noté à cette période de l'année (Kamp & Diallo 1999).

Threskiornithidae

Plegadis falcinellus Ibis falcinelle. La plupart ont été vus dans la plaine de Séri et autour du lac Débo. Il n'a été que partiellement repérés d'avion, des dénombrements crépusculaires effectués en 2001 aboutissant à un effectif de 12000–14000 dans le secteur du Débo.

Threskiornis aethiopica Ibis sacré. N'a été observé qu'en petit nombre (Tableau 1), dans la plaine de Séri et autour du lac Débo. Les suivis effectués récemment dans le complexe Débo (Wymenga *et al.* 2002) montrent que l'espèce n'est en nombre conséquent qu'à partir de mars ou avril.

Platalea alba Spatule d’Afrique. Quelques-unes (Tableau 1) étaient présentes sur le lac Faguibine et dans le secteur du lac Débo.

Anatidae

Six espèces de canards afrotropicales et quatre espèces paléarctiques ont été observées (Tableau 2). Au cours de ces trois dénombrements effectués dans des conditions d’inondation assez semblables, les effectifs ont très fortement varié, tant pour les espèces afrotropicales que pour les paléarctiques. La majorité est présente dans la partie nord du delta, avec une répartition variable selon les années (Girard *et al.* 2004). Au cours de ces trois années, le Mali a accueilli entre le tiers et la moitié des canards comptés en Afrique de l’Ouest (Dodman & Diagana 2003). Pour quasiment toutes ces espèces, les prospections effectuées au cours de ces trois années ont permis d’obtenir des estimations nettement plus importantes que celles retenues au cours de cette dernière décennie (Perennou 1991, 1992, Taylor & Rose 1994, Dodman & Taylor 1995, 1996, Dodman *et al.* 1997, 1998). Girard (2004) et Girard *et al.* (2004) proposent donc de revoir les estimations de la plupart des espèces ainsi que l’importance relative du Mali au sein de l’Afrique de l’Ouest.

Tableau 2. Effectifs d’Anatidae dénombrés dans le delta intérieur du Niger en janvier 1999, 2000 et 2001.

	1999	2000	2001
<i>Dendrocygna bicolor</i> Dendrocygne fauve	88	7735	2795
<i>Dendrocygna viduata</i> Dendrocygne veuf	7800	47310	70950
<i>Dendrocygna</i> spp. Dendrocygne spp.	0	0	11565
<i>Alopochen aegyptiacus</i> Oie d’Egypte	6	47	0
<i>Plectropterus gambensis</i> Oie de Gambie	2500	5760	3220
<i>Sarkidiornis melanotos</i> Canard casqué	330	4300	610
<i>Nettapus auritus</i> Sarcelle à oreillons	0	5	12
<i>Anas acuta</i> Canard pilet	40000	116650	164160
<i>A. querquedula</i> Sarcelle d’été	210000	515680	744000
<i>A. clypeata</i> Canard souchet	0	200	195
<i>Anas</i> spp. Canards indéterminés	0	0	3810
<i>Aythya nyroca</i> Fuligule nyroca	7800	13020	12270

Dendrocygna viduata Dendrocygne veuf. Toujours dominant entre les afrotropicales, totalisant de 73–91% des individus (Tableau 2).

Nettapus auritus Sarcelle à oreillons. Se tenant sur des mares fortement végétalisées, est très difficile à détecter d’avion.

Anas acuta Canard pilet. Les effectifs recensés en 2000 et 2001 sont similaires à ceux enregistrés au début des années 1990. L’effectif présent chaque année dans le delta doit varier de 20–40% des oiseaux hivernant en Afrique de l’Ouest (Girard *et al.* 2004).

A. querquedula Sarcelle d'été. Toujours l'espèce dominante entre les espèces paléarctiques (80%) (Tableau 2). Le delta doit accueillir entre le tiers et la moitié des oiseaux hivernant en Afrique de l'Ouest (Girard *et al.* 2004).

A. clypeata Canard souchet. C'est la seule espèce pour laquelle il semble y avoir un net déclin depuis une trentaine d'années; les effectifs sont passés de quelques milliers à la fin des années 1970 (Lamarche 1980).

Aythya nyroca Fuligule nyroca. Les effectifs recensés permettent de revoir à la hausse l'estimation de la population présente en Afrique de l'Ouest et centrale: 15000–17000 oiseaux (Trolliet & Girard 2001a); de la moitié à la quasi totalité des oiseaux hivernants en Afrique de l'Ouest sont au Mali.

Gruidae

Balearica pavonina Grue couronnée. De 1999 à 2001 nous n'avons vu respectivement que 53, 3 et 7 oiseaux. Elle subit un fort déclin sur l'ensemble de l'Afrique de l'Ouest et fait l'objet d'une exploitation excessive sur les quelques secteurs où elle est encore présente sur le delta (Wymenga *et al.* 2002).

Recurvirostridae, Glareolidae, Charadriidae, Scolopacidae

Nous avons observé une trentaine d'espèces de limicoles lors des prospections terrestres. Cependant, nous ne retiendrons que les espèces pour lesquelles nos observations aériennes sont significatives. Ainsi, les limicoles de petite taille (gravelots *Charadrius* spp., bécasseaux *Calidris* spp., chevaliers *Tringa* spp.) présents en très grands nombres sur l'ensemble du delta, et les espèces difficiles à repérer et/ou dispersées (oedicnèmes *Burhinus* spp., courvites *Cursorius* spp., glaréoles *Glareola* spp.) ne sont pour la plupart pas traitées.

Himantopus himantopus Echasse blanche. Les recensements sous-estiment assez fortement l'effectif hivernant dans le delta qui doit être de *c.* 15000–20000 oiseaux (Girard *et al.* sous presse).

Pluvianus aegyptius Pluvier d'Égypte. Présent sur la plupart des berges des marigots, rivières ou lacs en eau.

Vanellus tectus Vanneau à tête noire. Présent partout en savane.

V. spinosus Vanneau éperonné. Omniprésent sur les berges des marigots, rivières ou lacs en eau.

Philomachus pugnax Combattant. Largement dominant parmi les espèces retenues (Tableau 3), répartie sur l'ensemble du delta, se rencontre également sur toutes les dépressions humides du pays, y compris dans les zones désertiques (plaine de Gourma). L'effectif hivernant au Mali est *c.* 300 000, soit près du tiers des oiseaux ouest-africains (Trolliet & Girard 2001b).

Limosa limosa Barge à queue noire. Peut être présente en grand nombre, avec cependant de grandes variations inter-annuelles, pour une couverture aérienne semblable et avec les mêmes conditions de dénombrements. En 1999 et en 2001, les effectifs présents au Mali représentent 75% des oiseaux comptés en Afrique de l'Ouest (Girard *et al.* sous presse).

Tringa nebularia Chevalier aboyeur. La seule espèce de chevalier pour laquelle nous avons assez systématiquement enregistré nos observations. L'effectif maximal ne

représente qu’une petite partie de l’effectif présent, vraisemblablement de plusieurs milliers d’individus (Girard *et al.* sous presse).

Tableau 3: Effectifs de quelques espèces de limicoles dénombrés dans le delta intérieur du Niger en janvier 1999, 2000 et 2001.

	1999	2000	2001
<i>Himantopus himantopus</i> Echasse blanche	3000	3050	7480
<i>Pluvianus aegyptius</i> Pluvian d’Egypte	500	250	210
<i>Vanellus tectus</i> Vanneau à tête noire	200	232	105
<i>V. spinosus</i> Vanneau éperonné	1500	1315	1540
<i>Philomachus pugnax</i> Combattant	148000	135180	188100
<i>Limosa limosa</i> Barge à queue noire	10000	3075	40280
<i>Tringa nebularia</i> Chevalier aboyeur	650	260	235

Laridae

Seulement six espèces ont été identifiées lors de ces missions (Tableau 4). La Mouette à tête grise, le Goéland brun, la Sterne hansel et la Sterne caspienne ont été vus lors des comptages aériens. La Guifette leucoptère *Chlidonias leucopterus* et la Guifette moustac *C. hybridus* n’ont été observées que lors des prospections terrestres. Les effectifs dénombrés sont partiels et ne reflètent qu’imparfaitement ceux présents à cette époque de l’année

Tableau 4: Effectifs de quelques espèces de Laridae dénombrés dans le delta intérieur du Niger en janvier 1999, 2000 et 2001.

	1999	2000	2001
<i>Larus cirrocephalus</i> Mouette à tête grise	5		
<i>L. fuscus</i> Goéland brun			31
<i>Gelochelidon nilotica</i> Sterne hansel	5000	340	3270
<i>Sterna caspia</i> Sterne caspienne	200	34	87
<i>Sterna/Chlidonias</i> spp. Sternes/guifettes	2500	7230	2485

Remerciements

Nous tenons à remercier les organismes, en particulier la Commission Européenne (DG VIII), l’Office National de la Chasse et de la Faune Sauvage (France), la Direction Nationale de la Conservation de la Nature et les Directions Régionales de la Conservation de la Nature, l’IRD/Bamako et Wetlands International/Sévaré (Mali),

ainsi que toutes les personnes qui ont contribué à la réussite de ces missions. Nous adressons également nos remerciements à T. Dodman et P.W.P. Browne pour leurs remarques constructives sur la première version de ce manuscrit.

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Les oiseaux de la région de Sassandra, Côte d'Ivoire

par Olivier Lachenaud

1070 Avenue de Fès, 34080 Montpellier, France. <ilachenaud@numericable.fr>

Reçu 18 février 2005; revu 22 septembre 2005.

Résumé

L'avifaune de la région de Sassandra, dans le sud-ouest de la Côte d'Ivoire, était jusqu'alors mal connue. Une liste de 208 espèces est ici présentée, basée principalement sur les observations entre 1998 et 2002. De nombreuses espèces rares en Côte d'Ivoire ont été découvertes dans la région, tandis que d'autres ont été observées en-dehors de leur aire connue.

Summary

Birds of the Sassandra region. Ivory Coast. The avifauna of the Sassandra area in SW Ivory Coast was hitherto little-known. A list of 208 species is presented, based mainly on observations between 1998 and 2002. Many species rare in Ivory Coast have been discovered in the area, while others have been found out of their known range.

Introduction

La région de Sassandra (4°57'N, 6°8'W) est située à l'embouchure du fleuve Sassandra, l'un des plus grands de la Côte d'Ivoire. Son avifaune était jusqu'alors mal connue; Thiollay (1977, 1985) et Demey & Fishpool (1991) n'en mentionnent qu'un petit nombre d'espèces. Entre 1998 et 2002, j'ai effectué 24 visites dans la région, durant chacune 1–2 jours, soit l'équivalent de 29 jours d'observation au total. Ces visites étaient réparties sur tous les mois de septembre à mai, avec un pic (14 jours d'observation) pour les mois de jan–mars. Les observations présentées ici ont été réalisées dans un triangle entre Grand-Dréwin (7 km à l'ouest de Sassandra), Gaoulou (15 km au nord) et Dagbégo (20 km à l'est) (Fig. 1). Deux séances d'observation en mer (jusqu'à 20–25 km au large) ont également eu lieu en février et mai.

Description des milieux

La région ainsi délimitée est traversée d'est en ouest par la route Abidjan–Tabou dite “côtière”, et du nord au sud par trois cours d'eau: le Sassandra, son affluent la Davo,

et la Dagbé. Le climat du sud de la Côte d'Ivoire est de type subéquatorial à quatre saisons: deux saisons sèches (la "grande" de décembre à mars-avril et la "petite" en août-septembre) et deux saisons des pluies ("grande" de mai-juillet et "petite" en octobre-novembre). La pluviométrie moyenne annuelle est de 1600 mm environ, ce qui fait de Sassandra la localité la plus sèche de la côte ivoirienne; le mois de juin (500 mm) est le plus arrosé.

A leur embouchure, le Sassandra et la Dagbé forment deux lagunes d'assez faible étendue. Le relief est peu marqué, sauf aux abords de la côte où se dressent des collines aux pentes assez fortes. La côte est bordée de plages de sables assez étroites, à l'arrière desquelles se trouvent des collines; localement, les plages sont interrompues par des pointes rocheuses où les collines plongent directement dans la mer. L'arrière-plage et les premières pentes des collines sont couvertes d'un fourré littoral dense composé d'arbustes (*Baphia nitida*, *Chrysobalanus ellipticus*, *Ixora laxiflora*, *Napoleonaea vogelii*, *Phoenix reclinata*).

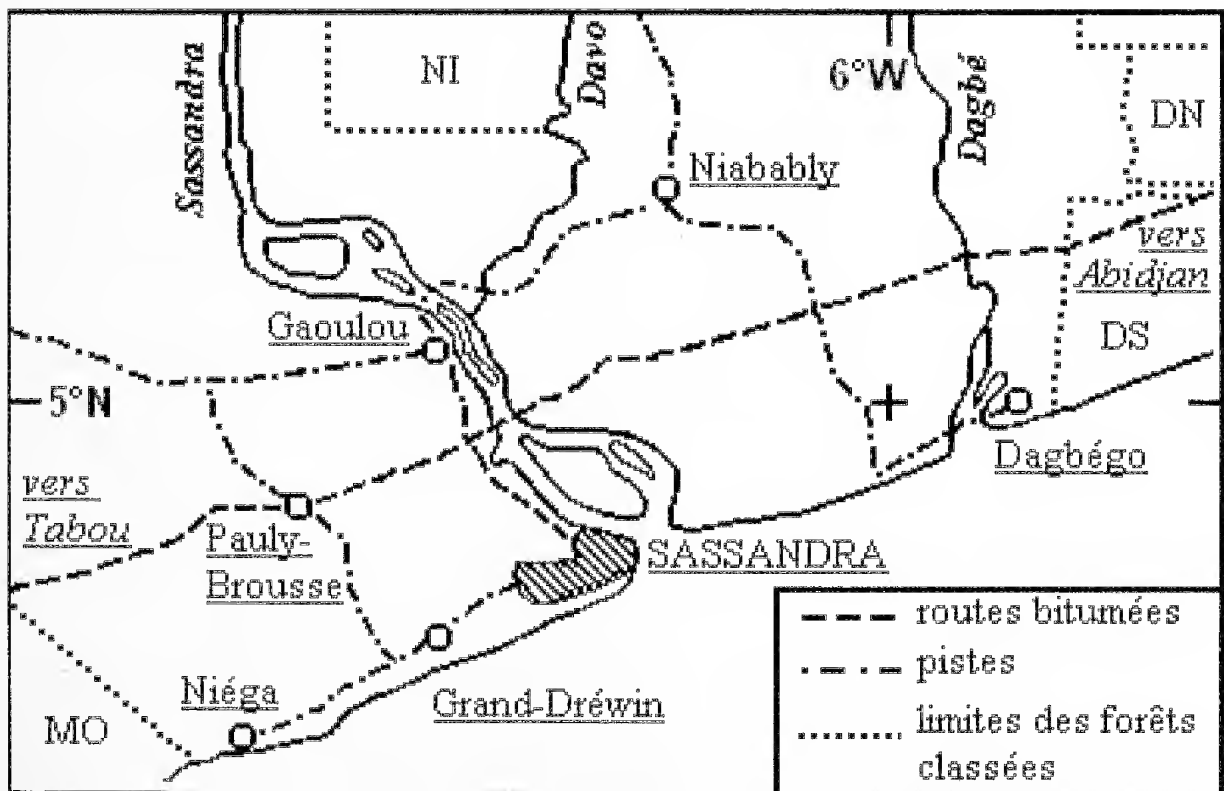


Figure 1. La région de Sassandra. Noms des localités souligné, des rivières en italique. Forêts Classées: DN = Dassioko (bloc nord), DS = Dassioko (bloc sud), MO = Monogaga, NI = Niégré.

Vers l'intérieur, le fourré littoral cède rapidement la place à la forêt dense. Les forêts de terre ferme de la région appartiennent au groupement à *Eremospatha*

macrocarpa et *Diospyros mannii* (Mangenot 1955, Guillaumet & Adjanohoun 1971). Leurs strates supérieures sont dominées par des légumineuses, notamment *Dialium aubrevillei*, *Erythrophleum ivorense*, *Berlinia occidentalis* et *Bussea occidentalis*. Le parasolier *Musanga cecropioides*, dont les fruits sont très appréciés par les oiseaux, est un élément typique des lisières et des jeunes recrûs.

Les forêts de la région ont été en grande partie défrichées et sont aujourd'hui remplacées par des plantations, notamment d'agrumes et de palmiers à huile, ou par des friches à *Chromolaena odorata*, plante introduite très envahissante formant des fourrés denses. Quelques îlots de forêt secondaire assez bien conservée subsistent cependant, notamment sur la rive est du Sassandra. Les forêts classées de Dassioko, de Monogaga et de la Niégré, qui se trouvent en périphérie de la région étudiée, sont encore relativement intactes, et mériteraient d'être explorées. La forêt ripicole, où abondent *Uapaca heudelotii*, *Pterocarpus santalinoides* et le palmier rotin *Calamus deeratus*, borde les fleuves. Sur les sols gorgés d'eau, croît une forêt marécageuse à *Raphia hookeri* et *Mitragyna ciliata*.

Les lagunes de Sassandra et de Dagbégo sont bordées de mangroves à *Rhizophora racemosa* et *Avicennia germinans*; les arbustes *Dalbergia ecastaphyllum*, *Machaerium lunatum* et *Hibiscus tiliaceus* y forment localement des fourrés denses au voisinage de l'eau. De grands bancs de vase sont découverts à marée basse, ce qui attire des limicoles, des hérons et surtout de très nombreuses sternes. Contrairement à la plupart des lagunes ivoiriennes, l'eutrophisation est ici très faible. La végétation flottante est peu développée sur la lagune de Dagbégo et totalement absente sur celle de Sassandra; cela explique peut-être l'absence remarquable de certaines espèces d'oiseaux, comme *Ardeola ralloides*.

Les nombreux rochers au milieu des fleuves constituent un habitat particulier auquel plusieurs espèces d'oiseaux sont associées (glaréoles, vanneaux, oedicnèmes). La plupart de ces rochers étaient autrefois submergés en saison des pluies, mais sont maintenant émergés toute l'année, l'établissement du barrage de Buyo (c. 100 km au nord) ayant entraîné une baisse des eaux du Sassandra. Ce phénomène peut expliquer la sédentarisation d'oiseaux habituellement migrateurs, comme *Glareola nuchalis* ou *Vanellus albiceps*.

Dans la ville de Sassandra et aux environs se trouvent des marais à végétation herbacée, avec quelques arbustes et petits arbres (*Rhizophora racemosa*, *Ficus trichopoda*) regroupés en bouquets épars; l'un de ces bosquets, au centre de la ville, abrite un dortoir de hérons et de cormorans, où se rassemblent plusieurs centaines d'oiseaux.

Enfin, une savane côtière dégradée, de faible étendue, subsiste autour de l'aéroport de Sassandra, à 6 km à l'ouest de la ville.

Aucune étude n'est disponible sur la faune de la région; quelques espèces remarquables de mammifères et de reptiles peuvent cependant être mentionnées. Un petit groupe d'Hippopotames *Hippopotamus amphibius* vit toujours sur le Sassandra. Trois espèces de singes, la Mone de Campbell *Cercopithecus campbelli*, le Hocheur à

nez blanc *C. petaurista* et le Cercopithèque diane *C. diana*, sont encore assez fréquentes. Le Lamantin *Trichechus senegalensis* existe encore sur la lagune de Sassandra, bien qu'il y soit devenu rare. Les crocodiles *Crocodylus niloticus* et *Osteolaemus tetraspis* peuvent être observés sur le Sassandra. Au moins deux espèces de tortues marines, la Tortue-luth *Dermochelys coriacea* et la Tortue olivâtre *Lepidochelys olivacea*, se rencontrent en mer. La flore n'a pas été étudiée en détail, mais elle est potentiellement riche; le sud-ouest ivoirien est en effet connu comme foyer d'endémisme (Guillaumet & Adjanooun 1971).

Résultats

Aux observations personnelles de l'auteur (191 espèces) s'ajoutent celles de Philippe Lachenaud (PL) et Jean-Marie Lepage (JML), ainsi que les données déjà publiées par Thiollay (1977, 1985) et Demey & Fishpool (1991). Les espèces non observées par l'auteur sont signalées d'un astérisque. La nomenclature suit celle de Borrow & Demey (2001), et les descriptions d'abondance (peu commun, fréquent, commun, abondant) suivrent Morel & Tye (1995).

Procellariidae

Calonectris diomedea Puffin cendré. Fréquent au large de Sassandra, fév, mai.

Hydrobates pelagicus Océanite tempête. Commun en fév et mai au large de Sassandra; un oiseau à seulement 5 km de la côte. Deux observations antérieures en Côte d'Ivoire, oct, nov (Cheke & Fishpool 1992).

Phalacrocoracidae

Phalacrocorax africanus Cormoran africain. Commun sur le fleuve et la lagune; le dortoir de hérons peut abriter jusqu'à 100 individus, dont beaucoup d'immatures.

Anhingidae

Anhinga rufa Anhinga d'Afrique. Peu commun durant la saison sèche (nov, jan-mars), observé soit dans le dortoir de hérons, soit en vol. Gatter (1997) suspecte l'existence d'une colonie à l'ouest de Sassandra; la forte proportion d'immatures (plus de la moitié des individus observés) accrédite cette hypothèse. L'espèce, commune au début du 20ème siècle (Bouet & Millet-Horsin 1916-7), a pratiquement disparu de Côte d'Ivoire.

Ardeidae

Tigriornis leucolophus Onoré à huppe blanche*. Un oiseau observé en plein jour dans la mangrove bordant la lagune de Sassandra, 21 fév 2000 (PL, JML). Sans doute plus fréquent: difficile à observer en raison de ses habitudes nocturnes.

Nycticorax nycticorax Bihoreau gris. Plusieurs oiseaux (dont des immatures) dans le dortoir de hérons à Sassandra, jan-fév 2002.

Butorides striata Héron strié. Commun sur les lagunes et sur le fleuve.

Bubulcus ibis Héron garde-bœufs. Commun dans les marais et les milieux ouverts.

Egretta gularis Aigrette dimorphe. Commune sur la lagune de Sassandra et au bord du fleuve.

E. garzetta Aigrette garzette. Abondante sur la lagune et dans les marais.

E. intermedia Aigrette intermédiaire. Peu commune, observée plusieurs fois sur la lagune de Sassandra en compagnie d'autres aigrettes.

E. alba Grande Aigrette. Commune dans les marais et a bord des lagunes; le dortoir de hérons en abrite quelques dizaines.

Ardea cinerea Héron cendré. Fréquent sur les lagunes et sur le fleuve.

A. goliath Héron goliath. Peu commun mais régulier sur le Sassandra, surtout au nord de la côte. Quitterait normalement la région durant la saison des pluies; cependant, un cas d'estivage a été noté en 2000 (JML). Rare et localisé en Côte d'Ivoire (Thiollay 1985, Demey & Fishpool 1991).

Ciconiidae

Ciconia abdimii Cigogne d'Abdim*. Un oiseau en avr 1981 à Dagbégo (Demey & Fishpool 1991).

C. episcopus Cigogne épiscopale. Migratrice, commune sur la lagune de Sassandra et sur le fleuve, déc-avr. Groupes comptant jusqu'à 18 oiseaux lors de la migration (JML).

Threskiornithidae

Bostrychia hagedash Ibis hagedash. Fréquent sur le Sassandra à Gaoulou.

Anatidae

Dendrocygna viduata Dendrocygne veuf. Migrateur (probablement non nicheur) commun en saison sèche sur les rochers du Sassandra au sud de la côte, en effectifs fluctuants, atteignant 150–200 oiseaux; quitte la région durant la saison des pluies (JML).

Nettapus auritus Anserelle naine. Trois sur le Sassandra au sud de la côte, 24 fév 2002.

Anas acuta Canard pilet*. Un oiseau observé à trois reprises sur le Sassandra au sud de la côte, en compagnie d'un groupe de *Dendrocygna viduata*, déc 1999 (JML). Migrateur rare en Côte d'Ivoire (Balchin 1988, Demey & Fishpool 1991).

Accipitridae

Pandion haliaetus Balbuzard pêcheur. Fréquent sur la lagune de Sassandra et sur le fleuve jusqu'à Gaoulou. Un oiseau bagué au nid à Korpo, Finlande, 11 sep 1996, trouvé mort à Sassandra, 17 mar 1997 (Rainey & Lachenaud 2002).

Aviceda cuculoides Baza coucou. Fréquent en forêt dégradée au bord du fleuve. En Côte d'Ivoire, Thiollay (1985) considère cette espèce comme résidente, se basant probablement sur ses observations dans la région de Lamto (Thiollay 1975). Dans le sud, l'espèce pourrait n'être que migratrice en saison sèche, nov-mars (obs. pers); cela reste toutefois à confirmer.

Pernis apivorus Bondrée apivore. Fréquent en mangrove et en forêt ripicole durant la saison sèche.

Macheiramphus alcinus Milan des chauves-souris. Un oiseau à Sassandra, 2 mai 1998.

Milvus migrans Milan noir. Migrateur abondant en saison sèche, niche dans les grands fromagers (*Ceiba pentandra*). Seule la sous-espèce africaine *parasitus* a été notée.

Haliaetus vocifer Pygargue vocifère*. Un oiseau à Sassandra, mars 2002 (JML et PL). Abondante au début du siècle sur les lagunes et les grands fleuves, l'espèce est devenue très rare en Côte d'Ivoire (Thiollay 1985, Rainey & Lachenaud 2002).

Gypohierax angolensis Vautour palmiste. Abondant en mangrove et dans la forêt ripicole au bord du Sassandra.

Circaetus beaudouini Circaète de Beaudouin*. Une observation (la seule sur la côte ivoirienne) près de Sassandra, fév (Thiollay 1985).

Polyboroides typus Petit serpentaire. Commun en forêt secondaire. Transport de matériaux de nid, avr.

Accipiter badius Epervier shikra. Peu commun: trois observations à Sassandra, sep, nov, mars. Nouvelle localité; cette espèce, répandue dans les savanes (Thiollay 1985), s'est récemment établie autour d'Abidjan (Rainey & Lachenaud 2002).

Accipiter tachiro Autour tachiro. Fréquent en forêt secondaire, à Dagbégo et Gaoulou.

Urotriorchis macrourus Autour à longue queue. Une observation sur la piste de Dagbégo, sep.

Kaupifalco monogrammicus Autour unibande*. Signalé de Sassandra par Thiollay (1977) mais n'y a pas été revu, alors qu'il s'agit d'une espèce très facilement repérable.

Buteo auguralis Buse d'Afrique. Peu commune, dans les milieux ouverts.

Hieraaetus pennatus Aigle botté. Un oiseau (phase pâle) avec des *Milvus migrans* à Sassandra, 16 déc 2001. Identifié par l'allure générale rappelant celle d'*H. ayresii*, le dessus brun avec une marque blanche au croupion, le dessous pâle, et les couvertures sous-alaires pâles contrastant nettement avec les rémiges noires. Première observation sur la côte ivoirienne, pour cette espèce des savanes (Thiollay 1985).

H. ayresii Aigle d'Ayres. Commun à Gaoulou, fréquent au sud jusqu'à la côte, en forêt ripicole. A son approche les calaos *Tockus fasciatus* se mettent à crier et s'envolent de tous côtés. Un oiseau transportant une brindille à Gaoulou, 6 jan 2001. Rare, surtout dans la zone de forêt sempervirente (Thiollay 1985, Demey & Fishpool 1991).

Spizaetus africanus Aigle-autour de Cassin*. Signalé de Sassandra par Thiollay (1977), n'a pas été revu, mais passe facilement inaperçu.

Falconidae

Falco subbuteo Faucon hobereau. Un adulte à Sassandra, 14 nov 1999. Plusieurs observations possibles d'immatures.

F. peregrinus Faucon pèlerin. Un adulte capturant une hirondelle, sur le Sassandra au sud de la côte, 6 jan 2002. La grande taille, la coloration assez pâle du dessous et la localité suggèrent plutôt un oiseau d'origine paléarctique qu'un représentant de la sous-espèce *minor* (habituellement rencontrée dans les régions montagneuses).

Phasianidae

Francolinus achantensis Francolin d'Ahanta. Entendu à deux reprises dans la savane côtière autour de l'aéroport.

Turnicidae

Turnix sylvaticus Turnix d'Andalousie. Un oiseau le 15 déc 2001 et un couple le 23 fév 2002 sur la piste de l'aéroport de Sassandra.

Rallidae

Amaurornis flavirostra Râle à bec jaune. Commun dans les marais à végétation herbacée dense.

Sarothrura pulchra Râle perlé. Commun dans la forêt ripicole au bord du Sassandra.

Gallinula angulata Gallinule africaine. Deux observations sur le Sassandra au nord de la côte; probablement plus commune, mais discrète.

Heliornithidae

Podica senegalensis Grébifoulque d'Afrique. Commun sur les rives boisées du Sassandra. Vu se nourrir de crabes.

Jacaniidae

Actophilornis africana Jacana à poitrine dorée. Abondant dans les marais herbacés, vu également sur les rochers du Sassandra. Un adulte avec deux poussins, jan.

Haematopodidae

Haematopus ostralegus Huîtrier pie*. Un oiseau à Sassandra, déc 1988 (Demey & Fishpool 1991).

Burhinidae

Burhinus senegalensis Oedicnème du Sénégal. Fréquent sur les rochers du Sassandra.

Burhinus vermiculatus Oedicnème vermiculé. Quatre sur la lagune de Dagbégo, 20 mai 2002.

Glareolidae

Pluvianus aegyptius Pluvier d'Egypte*. Un oiseau à Sassandra, déc 1988 (Demey & Fishpool 1991).

Glareola nuchalis Glaréole auréolée. Abondante sur les rochers du Sassandra et de la Dagbé. Présente toute l'année, même en été (JML, cf. Thiollay 1985). L'établissement du barrage de Buyo, et la baisse consécutive des eaux du Sassandra, ont peut-être permis sa sédentarisation.

Charadriidae

Charadrius hiaticula Grand gravelot. Fréquent sur la côte et sur la lagune de Sassandra.

Pluvialis squatarola Pluvier argenté. Un oiseau à Sassandra, 16 déc 2001.

Vanellus albiceps Vanneau à tête blanche. Fréquent, 1–2 couples sur les rochers du Sassandra. Présents toute l'année (JML), peut-être suite à l'établissement du barrage de Buyo (cf. Thiollay 1985).

V. spinosus Vanneau armé*. Un oiseau sur un rocher du Sassandra, au sud de la côte, 7 avr 2002 (PL).

Scolopacidae

Limosa limosa Barge à queue noire*. Un oiseau à Dagbégo, avr 1981 (Demey & Fishpool 1991).

L. lapponica Barge rousse. Fréquent en hiver à Sassandra (cf. Demey & Fishpool 1991).

Numenius arquata Courlis cendré. Un oiseau en vol au-dessus de l'aéroport de Sassandra, 15 déc 2001.

N. phaeopus Courlis corlieu. Commun toute l'année y compris en été (JML) sur la lagune de Sassandra. Thiollay (1985) ne mentionne pas d'oiseaux estivant.

Tringa totanus Chevalier gambette*. Une observation sur la lagune de Sassandra (JML).

T. nebularia Chevalier aboyeur. Fréquent sur la lagune de Sassandra et dans les marais voisins.

Actitis hypoleucos Chevalier guignette. Abondant au bord des lagunes et des rivières, de nombreux oiseaux estivent (JML).

Calidris minuta/temminckii Bécasseau minute/de Temminck. Groupe de c. 25 sur les vasières de la lagune de Sassandra, 5 mars 2000.

Calidris alba Bécasseau sanderling. Deux observations à l'embouchure du Sassandra. Semble avoir régressé en Côte d'Ivoire depuis Thiollay (1985) qui le disait abondant.

Arenaria interpres Tournepierre à collier*. Une observation à l'embouchure du Sassandra (N. Armandy com. pers.).

Phalaropus fulicarius Phalarope à bec large. Commun, en petits groupes, au large de Sassandra, fév, mai. Cinq mentions antérieures en Côte d'Ivoire, dont quatre dans l'intérieur (Thiollay 1985, Demey & Fishpool 1991).

Stercorariidae

Stercorarius parasiticus Labbe parasite. Probablement fréquent au large: deux le 23 fév 2002 et deux le 19 mai 2002. Rare sur la côte: un oiseau à Sassandra, 10 sept 2000. Tous en phase sombre.

Laridae

Larus fuscus Goéland brun. Peu commun mais régulier sur la lagune de Sassandra, en compagnie de groupes de sternes. Deux observations d'oiseaux de première année, mars 2000, jan 2001. Trois oiseaux, tous en plumage de troisième année, fév 2001; l'un d'eux paraissait correspondre à la sous-espèce *graellsii* (dos gris ardoise relativement clair), un autre était nettement plus sombre, et le troisième intermédiaire. Huit mentions antérieures (Thiollay 1985, Demey & Fishpool 1991).

Sternidae

Sterna maxima Sterne royale. Abondante sur la lagune de Sassandra

S. sandvicensis Sterne caugek. Abondante sur la lagune de Sassandra, formant avec *S. maxima* des bandes mixtes de plusieurs centaines d'oiseaux.

S. hirundo Sterne pierregarin. Fréquente sur la côte, abondante au large.

Chlidonias leucopterus Guifette leucoptère. Groupe d'environ 15 en plumage nuptial, en compagnie de sternes pierregarin à Sassandra, 2 mai 1998. Thiollay (1985) la mentionne jusqu'en mars seulement.

C. niger Guifette noire. Deux observations sur la côte mais très abondante au large de Sassandra en mai.

Rhynchopidae

Rhynchops flavirostris Bec-en-ciseaux d'Afrique*. Un oiseau sur les rochers du Sassandra, à 10 km environ de la côte, 12 fév 2000 (JML). Il pourrait s'agir d'un

nicheur rare, étant donné l'habitat et la saison: niche en déc-mars au Liberia (Gatter 1997), en fév dans le sud-ouest de la Côte d'Ivoire (Demey & Fishpool 1991).

Columbidae

Treron calvus Colombar à front nu . Abondant en forêt.

Turtur tympanistria Tourtelette tambourette . Fréquente en forêt ripicole, mais aussi dans les marais arbustifs ouverts.

T. afer Tourtelette émeraude. Commune dans les milieux ouverts.

Streptopelia semitorquata Tourterelle à collier. Abondante dans les milieux ouverts, particulièrement dans les marais arbustifs où elle forme des groupes atteignant 200 oiseaux.

S. senegalensis Tourterelle maillée. Commune dans les milieux ouverts.

Psittaciidae

Psittacus erithacus Perroquet jaco. Encore commun en forêt bien qu'il se soit considérablement raréfié en Côte d'Ivoire.

Musophagidae

Corythaeola cristata Touraco géant. Cet oiseau, victime de la chasse, a beaucoup régressé en Côte d'Ivoire, mais il est toujours commun dans la région; en forêt, généralement dans les cimes de *Dialium aubrevillei* dont il apprécie les fruits.

Tauraco macrorhynchus Touraco à gros bec. Fréquent en forêt.

Crinifer piscator Touraco gris. Fréquent dans les fourrés littoraux.

Cuculidae

Oxylophus levaillanti Coucou de Levaillant. Fréquent dans les fourrés littoraux et la végétation ripicole au bord du Sassandra; en saison sèche (déc-fév).

Cuculus canorus Coucou gris. Un oiseau sur le Sassandra, au niveau de la côtière, 19 mars 2000. Le dessous de la queue, observé dans de bonnes conditions (l'oiseau survola le fleuve à quelques mètres au-dessus de notre pirogue, avant de se poser dans un arbre sur la rive), était nettement noir avec seulement de petites taches blanches (comme chez les *C. canorus* que nous avons pu voir en Europe) et non barré transversalement de blanc comme chez le Coucou africain *C. gularis*; la nuance chamois sur la poitrine indiquait une femelle. Troisième observation en Côte d'Ivoire et la première sur la côte (Thiollay 1985, Gartshore *et al.* 1995) mais passe évidemment inaperçu; régulier au Libéria (Gatter 1997).

Chrysococcyx cupreus Coucou foliotocol. Commun en forêt.

C. klaasi Coucou de Klaas. Peu commun en forêt secondaire.

C. caprius Coucou didric. Fréquent dans les milieux ouverts, en particulier les marais arbustifs.

Ceuthmochares aereus Malcoha à bec jaune. Fréquent en forêt, également observé dans les fourrés arbustifs bordant la mangrove.

Centropus grillii Coucal de Grill. Un oiseau sur une piste bordant des friches à *Chromolaena odorata*, près de Sassandra, 26 sep 1999.

C. senegalensis Coucal du Sénégal. Commun dans les milieux ouverts. La forme mélanique "*epomidis*", pourtant répandue dans la zone forestière, et qui représente

près de la moitié des individus dans la région d'Abidjan, n'a jamais été observée dans la région de Sassandra.

C. monachus Coucal moine. Peu commun à Sassandra, où il fréquente les marais à hautes herbes.

Tytonidae

Tyto alba Effraie des clochers*. Observée régulièrement à Sassandra (JML).

Strigidae

Bubo africanus Grand-duc africain*. Un oiseau à l'hôtel "L'Hélice", à 7 km à l'ouest de Sassandra, 15 déc 2001. N'avait été vue que deux fois dans la région côtière (Thiollay 1985, Rainey & Lachenaud 2002).

Apodidae

Rhaphidura sabini Martinet de Sabine. Peu commun mais régulier sur le Sassandra au nord de la côtière.

Telacanthura ussheri Martinet d'Ussher. Commun dans les milieux ouverts.

Neafrapus cassini Martinet de Cassin. Deux oiseaux à Gaoulou, 6 déc 1998.

Cypsiurus parvus Martinet des palmiers. Abondant dans les milieux ouverts.

Apus apus Martinet noir. Commun dans les milieux ouverts, au moment des passages d'automne et de printemps, formant en mars des groupes de plusieurs centaines d'oiseaux au-dessus de la lagune. Rare ou absent déc-jan.

A. affinis Martinet des maisons. Abondant dans les milieux ouverts; niche sous le pont de la côtière.

Alcedinidae

Halcyon leucocephala Martin-chasseur à tête grise*. Signalé de Sassandra par Demey & Fishpool (1991), l'oiseau n'a pas été revu.

H. malimbica Martin-chasseur à poitrine bleue. Abondant en mangrove, rare en forêt ripicole (Gaoulou).

H. senegalensis Martin-chasseur du Sénégal. Commun dans les milieux ouverts, en particulier les marais et les bords de rivières.

Ceyx pictus Martin-pêcheur pygmée. Commun dans les milieux ouverts.

Alcedo cristata Martin-pêcheur huppé. Fréquent dans les marais arbustifs, et sur le Sassandra au sud de la côtière.

A. quadribrachys Martin-pêcheur azuré. Fréquent sur le Sassandra à Gaoulou, plus rare au sud de la côtière.

Megaceryle maxima Martin-pêcheur géant. Commun au bord des lagunes et sur le Sassandra jusqu'à Gaoulou.

Ceryle rudis Martin-pêcheur pie. Fréquent dans la mangrove bordant les lagunes de Sassandra et Dagbégo.

Meropidae

Merops gularis Guêpier noir. Fréquent en forêt ripicole, où il affectionne tout particulièrement les palmiers rotins au bord de l'eau; plus rare en forêt dégradée loin des rivières, et une observation en mangrove.

M. pusillus Guêpier nain. Commun dans les milieux ouverts.

M. albicollis Guêpier à gorge blanche. Migrateur, abondant en saison sèche dans les milieux ouverts.

Coraciidae

Eurystomus glaucurus Rolle africain. Migrateur, commun en saison sèche dans les milieux ouverts et en forêt ripicole au bord du Sassandra. Groupes de 50–100 autour des essaims d'insectes en mars.

Bucerotidae

Tropicranus albocristatus Calao à huppe blanche. Commun en forêt.

Tockus fasciatus Calao longibande. Abondant en forêt. Nid à Gaoulou, déc.

Bycanistes fistulator Calao siffleur. Abondant en forêt (surtout ripicole) et mangrove.

B. cylindricus/subcylindricus Calao à joues brunes/à joues grises*. Deux oiseaux sur le Sassandra au sud de la côtière, 7 avr 2002 (PL).

Lybiidae

Gymnobucco calvus Barbu chauve. Fréquent en forêt secondaire à Gaoulou.

Pogoniulus scolopaceus Barbion grivelé. Peu commun en forêt, également observé dans les fourrés littoraux.

P. subsulphureus Barbion à gorge jaune. Commun en forêt mais aussi (entendu et observé) dans les fourrés littoraux, les brousses secondaires, et même la vieille mangrove. *P. bilineatus*, facilement détectable par son chant, est absent de la région.

Tricholaema hirsuta Barbu hérissé. Fréquent (entendu) en forêt.

Lybius vieilloti Barbu de Vieillot. Une observation dans la savane côtière près de l'aéroport.

Picidae

Dendropicos pyrrhogaster Pic à ventre rouge. Commun à Gaoulou en forêt secondaire.

Hirundinidae

Psalidoprocne obscura Hirondelle fanti. Commune dans les milieux ouverts, surtout au bord du fleuve à Gaoulou.

Riparia riparia Hirondelle de rivage. Trois observations sur le Sassandra au sud de la côtière: une avec d'autres hirondelles 19 mars 2000; deux, 16 déc 2001; six, 6 jan 2002. Rare en Côte d'Ivoire (Thiollay 1985, Walsh 1986, Balchin 1988, Demey & Fishpool 1991).

Hirundo semirufa Hirondelle à ventre roux. Peu commune dans les milieux ouverts.

H. senegalensis Hirondelle des mosquées. Commune mais toujours observée sur le même site, à quelques kilomètres au nord de Sassandra, en lisière d'une plantation; présente sep–avr au moins. Thiollay (1985) la mentionne seulement de l'extrême nord; locale aujourd'hui jusque sur la côte (Lachenaud 2004).

H. abyssinica Hirondelle à gorge striée. Abondante dans les milieux ouverts.

H. nigrita Hirondelle noire. Abondante sur les rochers du Sassandra et de la Dagbé. Nid trouvé dans un bateau, sep (JML).

H. aethiopica Hirondelle d'Ethiopie. Commune à Sassandra, jan–mai au moins. Collecte de matériaux de nid, mars; un immature, fév. En phase d'expansion vers l'ouest (Grimes 1987, Demey & Fishpool 1991, Lachenaud *et al.* en préparation).

H. rustica Hirondelle de cheminée. Abondante en saison sèche, dans les milieux ouverts.

Motacillidae

Motacilla flava Bergeronnette printanière. Fréquente en saison sèche dans les milieux ouverts. La sous-espèce *thunbergi* a été identifiée dans la région, mais d'autres sous-espèces peuvent se rencontrer.

M. aguimp Bergeronnette pie. Commune sur les rochers du Sassandra près de Gaoulou; une observation au bord de la lagune à Sassandra.

Anthus leucophrys Pipit à dos uni. Commun dans les milieux ouverts.

Macronyx croceus Sentinelle à gorge jaune. Peu commune, dans les milieux ouverts.

Pycnonotidae

Andropadus virens Bulbul verdâtre. Commun en forêt dégradée.

A. gracilis Bulbul gracie. Observé à Dagbégo, se nourrissant des fruits de *Trema guineensis*. Probablement plus commun.

A. curvirostris Bulbul curvirostre. Une observation à Gaoulou. Probablement plus commun.

A. gracilirostris Bulbul à bec grêle. Observé à Dagbégo, se nourrissant des fruits de *Trema guineensis* en compagnie d'*A. gracilis*.

A. latirostris Bulbul à moustaches jaunes. Commun en forêt, vu à Gaoulou et à Dagbégo.

Baeopogon indicator Bulbul indicateur. Peu commun en forêt, vu à Dagbégo.

Chlorocichla simplex Bulbul modeste. Abondant dans les fourrés littoraux.

Thescelocichla leucopleura Bulbul des raphias. Abondant en forêt ripicole.

Bleda canicapillus Bulbul fourmilier. Peu commun (surtout entendu) en forêt, mais également dans le fourré littoral.

Criniger barbatus Bulbul crinon. Une observation en forêt secondaire sur la piste de Dagbégo. Probablement plus commun.

Pycnonotus barbatus Bulbul commun. Abondant dans les milieux ouverts.

Turdidae

Cossypha niveicapilla Cossyphe à tête blanche. Fréquent dans les fourrés littoraux.

Saxicola rubetra Traquet tarier. Un oiseau à l'aéroport de Sassandra, 23 fév 2000.

Sylviidae

Cisticola erythrops Cisticole à face rousse. Commune dans les zones défrichées des fourrés littoraux. Nourrissage de jeunes, sep.

C. cantans Cisticole chanteuse. Une observation dans la savane côtière près de l'aéroport.

C. lateralis Cisticole siffleuse. Commune dans les friches autour de Sassandra.

C. galactotes Cisticole roussâtre. Commune surtout dans les marais, mais aussi en milieu sec, dans les herbes bordant la piste de l'aéroport.

C. brachypterus Cisticole à ailes courtes. Peu commune, dans les défrichements des fourrés littoraux.

Prinia subflava Prinia commune. Commune dans les milieux ouverts.

Apalis sharpii Apalis de Sharpe. Peu commune en forêt; entendue à Dagbégo et sur le Sassandra au sud de la côte.

Camaroptera brachyura Camaroptère à dos gris. Abondant dans les fourrés littoraux et les milieux ouverts.

C. superciliaris Camaroptère à sourcils jaunes. Peu commun, en forêt dégradée.

M. kemp Nasique de Kemp*. Signalé de Sassandra par Demey & Fishpool (1991).

M. concolor Nasique grise. Fréquente en forêt à Gaoulou, observée également dans le fourré littoral à Sassandra.

Sylvietta virens Crombec verte. Commune dans les fourrés littoraux et les défrichements en forêt.

Phylloscopus sibilatrix Pouillot siffleur. Peu commun mais régulier en saison sèche (surtout mars-avr, une observation jan) en forêt secondaire, vu également dans un jardin.

Hylia prasina Hylia verte. Commune en forêt et dans les fourrés littoraux.

Muscicapidae

Fraseria cinerascens Gobe-mouches à sourcils blancs. Commun à Gaoulou, dans la forêt ripicole au bord du Sassandra.

Muscicapa striata Gobe-mouches gris. Migrateur fréquent en saison sèche (nov-mars) dans les milieux ouverts.

M. cassini Gobe-mouches de Cassin. Abondant à Gaoulou sur les rochers du Sassandra. Transport de matériaux de nid, déc 1998; adulte nourrissant un jeune, avr 2000.

Monarchidae

Terpsiphone rufiventer Tchitrec à ventre roux. Commun en forêt et dans les fourrés littoraux.

Platysteiridae

Bias musicus Bias musicien. Peu commun, observé plusieurs fois à Gaoulou, en vol au-dessus de la forêt secondaire.

Dyaphorophya castanea Pririt châtain. Fréquent en forêt à Gaoulou.

Platysteira cyanea Pririt à collier. Commun dans les fourrés littoraux, la savane côtière près de l'aéroport, et les jardins.

Timaliidae

Illadopsis fulvescens Akalat brun. Vu une fois à Gaoulou, en forêt secondaire.

Nectariniidae

Anthreptes gabonicus Souimanga brun. Commun en mangrove et en forêt ripicole. Deux nids occupés (Sassandra, Gaoulou), jan.

A. seimundi Souimanga de Seimund. Une observation à Dagbégo, en lisière de forêt secondaire. Probablement plus commun, mais difficile à détecter.

Deleornis fraseri Souimanga de Fraser. Abondant en forêt à Gaoulou.

Anabathmis reichenbachii Souimanga de Reichenbach. Commun dans une plantation d'agrumes au nord de Sassandra, plus rare dans la ville même; observé souvent sur des guis (Loranthaceae) en fleurs. Immatures, jan, mars.

Cyanomitra verticalis Souimanga à tête verte. Une observation dans un jardin à Sassandra, déc.

C. olivacea Souimanga olivâtre. Commun en forêt, mais également dans les fourrés littoraux.

Chalcomitra adelberti Souimanga à gorge rousse. Fréquent en forêt.

Hedydipna collaris Souimanga à collier. Abondant en forêt et dans les fourrés littoraux, pénètre même dans les jardins. Mange les fruits de *Rauwolfia vomitoria*. Nourrissage de jeunes volants, déc.

Cinnyris chloropygius Souimanga à ventre olive. Abondant dans les fourrés littoraux, les jardins et les défrichements en forêt. Nourrissage d'un jeune, jan.

C. superbus Souimanga superbe. Peu commun, observé en forêt à Gaoulou; visite les fleurs d'*Erythrina mildbraedii*.

C. cupreus Souimanga cuivré. Commun dans les jardins à Sassandra.

Zosteropidae

Zosterops senegalensis Zostérops jaune. Commun dans la savane et les fourrés littoraux, également dans les jardins, où on le voit souvent dans les filaos (*Casuarina*) dont il mange les graines. Espèce répandue en Côte d'Ivoire dans la zone des savanes, beaucoup plus locale sur la côte (Thiollay 1985, Demey & Fishpool 1991). Ces oiseaux, qui ont le dessous d'un jaune assez pâle et une teinte verte apparente sur les côtés de la poitrine, pourraient appartenir à la sous-espèce *demeryi*

Laniidae

Lanius collaris Pie-grièche fiscale. Peu commune à Sassandra, dans les jardins et les friches.

L. senator Pie-grièche à tête rousse. Un oiseau à Sassandra, 18 fév 2001 (sous-espèce *senator*).

Dicruridae

Dicrurus modestus Drongo modeste. Commun en forêt.

Corvidae

Corvus albus Corbeau pie. Abondant dans les milieux ouverts.

Sturnidae

Poeoptera lugubris Rufipenne à queue étroite. Fréquent à Gaoulou, en forêt ripicole; toujours seul ou par paires.

Onychognathus fulgidus Rufipenne de forêt*. Signalé de Sassandra par Thiollay (1985), n'y a pas été revu.

Lamprotornis cupreocauda Choucador à queue bronzée. Deux observations de petits groupes en forêt, à Gaoulou et sur le Sassandra au sud de la côte. En périphérie de la zone étudiée, commun en forêt de Dassioko. Espèce quasi-menacée (Stattersfield & Capper 2000).

L. splendidus Choucador splendide. Commun en forêt ripicole et dans les jardins; particulièrement abondant dans les marais arbustifs avec quelques bouquets de grands arbres.

Cinnyricinclus leucogaster Spréo améthyste. Abondant dans la savane côtière autour de l'aéroport, groupes de 100–200 oiseaux, déc, fév. Jamais observé à Sassandra même.

Passeridae

Passer griseus Moineau gris. Commun dans la ville de Sassandra.

Ploceidae

Ploceus nigricollis Tisserin à cou noir. Abondant dans les fourrés littoraux et les milieux ouverts.

P. aurantius Tisserin orangé. Abondant dans les marais arbustifs et les fourrés bordant la mangrove, remonte le long du Sassandra dans la végétation ripicole. Niche en colonies avec *P. cucullatus* et *P. nigerrimus*.

P. nigerrimus Tisserin noir. Abondant dans les marais arbustifs.

P. cucullatus Tisserin gendarme. Abondant dans les marais arbustifs et les jardins, niche en compagnie des deux espèces précédentes.

Malimbus nitens Malimbe à bec bleu. Fréquent en forêt.

M. malimbicus Malimbe huppé. Fréquent sur les îles de Gaoulou, en forêt marécageuse.

M. scutatus Malimbe à queue rouge. Commun en forêt ripicole.

M. rubricollis Malimbe à tête rouge. Commun en forêt.

Euplectes macrourus Euplecte à dos d'or. Peu commun, dans les friches autour de la ville de Sassandra.

E. hordeaceus Euplecte monseigneur. Espèce apparemment erratique: abondant au nord de Sassandra, nichant dans les hautes herbes, sep 1998; une seule observation par la suite (date non notée).

Amblyospiza albifrons Gros-bec à front blanc*. Signalé de Sassandra par Thiollay (1985), n'a pas été revu.

Estrildidae

Nigrita canicapillus Nigrette à calotte grise. Commun en forêt.

N. bicolor Nigrette à ventre roux. Commun en forêt et dans les fourrés littoraux. Transport de matériaux de nid, oct (Dagbégo), déc (Gaoulou).

Estrilda melpoda Astrild à joues orange. Abondant dans les milieux ouverts.

Lonchura cucullata Spermete nonnette. Abondant dans les milieux ouverts.

L. bicolor Spermete à bec bleu. Commun dans les milieux ouverts, souvent en compagnie des deux espèces précédentes.

Viduidae

Vidua macroura Veuve dominicaine. Abondante dans les milieux ouverts.

Discussion

L'avifaune de la région s'élève à 208 espèces. Cette liste est cependant incomplète et reflète un biais dans la prospection des habitats. La plupart des observations ont été effectuées sur le fleuve et la lagune, ou dans la brousse côtière et les milieux anthropisés aux environs de la ville de Sassandra. Les observations d'oiseaux forestiers ont eu lieu principalement sur les îles du Sassandra près de Gaoulou, en

forêt dégradée; en dehors de deux visites à Dagbégo, la forêt à l'est du Sassandra, encore assez bien conservée, n'a pu être visitée, ce qui explique le nombre relativement peu élevé d'espèces forestières. La savane côtière n'a été visitée qu'à deux reprises, et mériterait également d'être davantage explorée.

Trois espèces considérées comme menacées (Stattersfield & Capper 2000) ont été observées dans la région, *Tigriornis leucolophus* (Données Insuffisantes), *Rhynchops flavirostris* et *Lamprotornis cupreocauda* (tous deux Quasi-menacés), et une espèce à répartition restreinte (*Apalis sharpii*). *R. flavirostris* et *L. cupreocauda* sont rares dans la région, et le premier n'y est peut-être qu'un visiteur accidentel. L'abondance de *T. leucolophus* est plus difficile à évaluer car il s'agit d'une espèce nocturne, mais il pourrait n'être pas rare; les mangroves et forêts ripicoles de la région constituent un habitat très favorable pour cette espèce. La Chouette-pêcheuse rousse *Scotopelia ussheri* n'a pas été observée, mais pourrait se rencontrer dans les mêmes milieux.

Certaines espèces observées, qui ne sont pas menacées au niveau mondial, le sont cependant en Côte d'Ivoire: c'est le cas de *Anhinga rufa*, dont la nidification est à rechercher dans la région, *Haliaeetus vocifer* et peut-être *Ardea goliath*.

Plusieurs espèces ont été observées en-dehors de leur aire ivoirienne connue: *Hirundo senegalensis*, signalée uniquement de l'extrême nord, mais découverte récemment en quelques localités du sud du pays (Lachenaud 2004), *H. aethiopica* et *Anabathmis reichenbachii* inconnus dans la moitié ouest du pays; *Accipiter badius* et *Bubo africanus* observés pour la première fois dans le sud-ouest. Un certain nombre de migrants paléarctiques, considérés comme rares ou peu communs en Côte d'Ivoire, ont également été notés: *Cuculus canorus*, *Anas acuta*, *Larus fuscus*, *Riparia riparia*, *Falco peregrinus*, *F. subbuteo*. Deux espèces pélagiques très rarement signalées de Côte d'Ivoire jusqu'alors, *Hydrobates pelagicus* et *Phalaropus fulicarius*, ont été trouvées en abondance.

Remerciements

Je remercie tout d'abord Jean-Marie Lepage, qui m'a guidé sur le fleuve, et dont l'expérience m'a été extrêmement utile. Mon père Philippe Lachenaud, ainsi que Nathalie Armandy, m'ont aimablement confié leurs observations. Je suis également reconnaissant à Volker Salewski et Tommy Pedersen pour leurs précieux conseils, à Hilaire Yaokokore-Beibro, qui m'a fourni une carte de la région, ainsi qu'à Ron Demey et Lincoln Fishpool pour leurs commentaires sur une première version de l'article.

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Changes in the number of cooperative breeding groups of Yellow-billed Shrike *Corvinella corvina* at the University of Ghana, Legon, over 34 years

by L.G. Grimes

3 St Nicholas Court, Warwick CV34 4JY, U.K. <lgrimes@freeuk.com>

Received 15 June 2005; revised 3 October 2005.

Summary

The number of groups of the Yellow-billed Shrike *Corvinella corvina* and the total number of shrikes on the campus of the University of Ghana at Legon were determined in 2004 and compared with similar data obtained in the 1970s. Both had increased despite the general degradation of the campus due to major building programmes and a tenfold increase in student numbers. Breeding data indicate that number of clutches laid has been unaffected by the changes in the environment and infrastructure of the campus, but whether the breeding success of individual groups or of the population has changed since the 1970s remains to be studied.

Résumé

Les changements du nombre de groupes de reproduction en coopération de la Corvinelle à bec jaune *Corvinella corvina* à l'Université du Ghana à Legon pendant 34 ans. Le nombre de groupes de Corvinelle à bec jaune *Corvinella corvina* et le nombre total de Corvinelles ont été déterminés en 2004 et comparés avec des données similaires obtenues dans les années 70. Tous deux avaient augmenté malgré la dégradation générale du campus avec ses importantes constructions et un décuplement du nombre d'étudiants. Les données de la reproduction indiquent que le nombre de pontes n'a pas été affecté par les modifications de l'environnement et de l'infrastructure du campus; mais que le succès de la reproduction des groupes individuels ou de la population ait changé depuis les années 70, reste à étudier.

Introduction

The group behaviour and breeding biology of the Yellow-billed Shrike *Corvinella corvina* was studied on the campus of the University of Ghana for five years from 1970

(Grimes 1980). Each group then consisted of *c.* 12 individuals (range 6–25), which took part (in varying degrees) in the defence of the group territory, in feeding the breeding female at the nest-building stage and while she incubated and brooded young, and in the care of fledglings. The average group territory was 16.6 ha (range 10.6–27.1) and the population density was 0.8 birds per ha. The sex ratio (female/male) in a group was not constant and in one group during a three-year period varied between 5/3 and 4/9. Shrikes sometimes moved between groups, over distances up to 2000 m. Clutches were recorded in all months except Oct, though most were laid Jan–Aug. Up to three broods were raised by some groups during a breeding season and the clutch following a successful breeding was laid while fledglings were being cared for by other group members. Groups usually have one breeding female but a second female may compete for breeding status either during a breeding season or at the beginning of a season.

Twenty-three groups were present at the start of the study and two new groups (Groups 24 and 25, Fig. 1) formed early in 1974 in areas not previously occupied by the shrike. Apart from Groups 2, 13 and 15 (Fig. 1), little or no detectable change occurred in either the territorial areas of the other groups or their boundary locations.

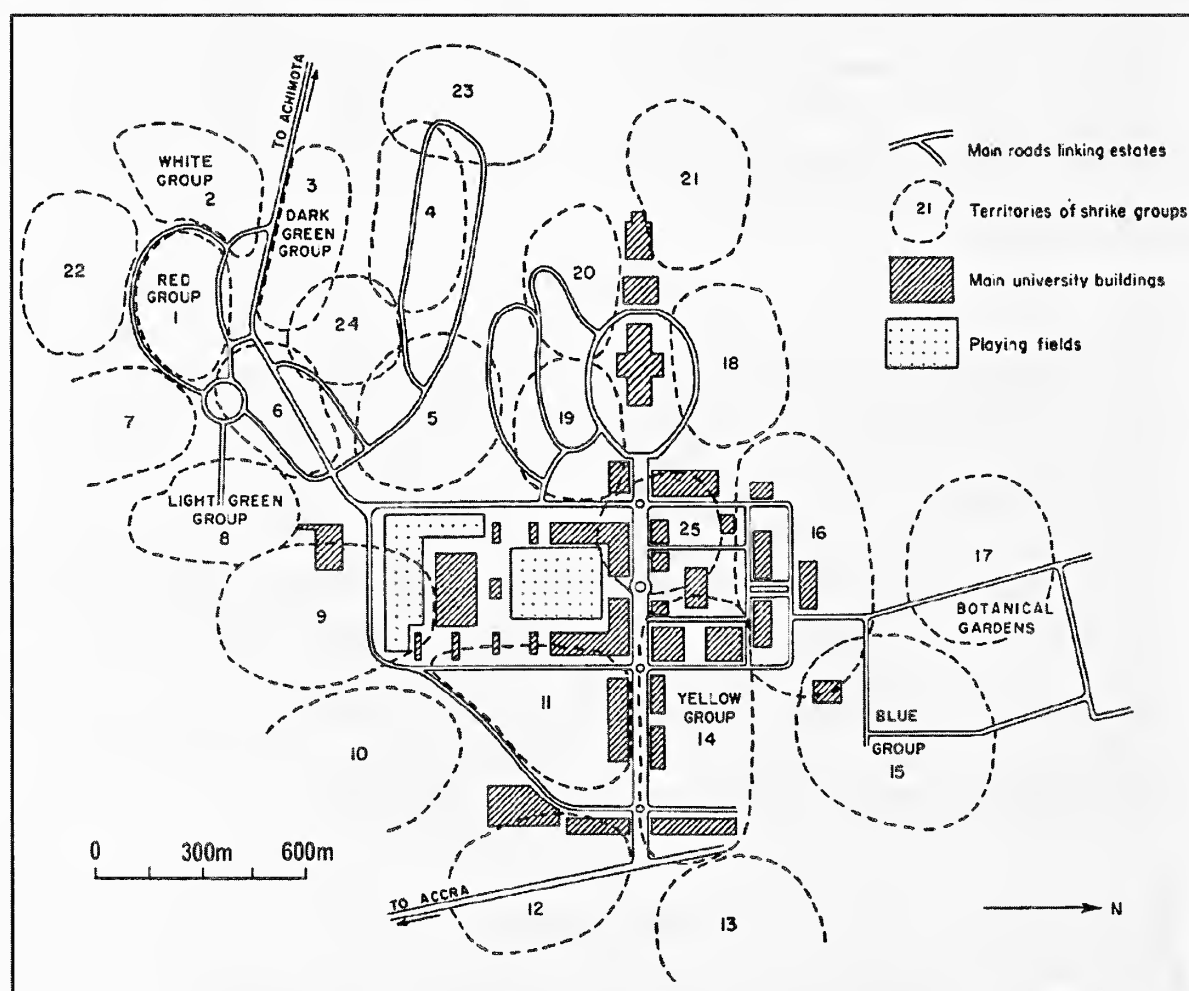


Figure 1. The distribution of group territories of the Yellow-billed Shrike on the campus of the University of Ghana at Legon in 1975 (after Grimes 1980).

cycle (nest building, incubation and brooding) and by other group members when visiting the nest (Grimes 1980). As a result most, if not all, groups and their nests on the campus were located during my stay. When not directly observed, the date of completion of a clutch was estimated using either the hatching date or the date when young left the nest. The number of shrikes in a group was counted either during territorial disputes or during playback of territorial calls when they invariably, but not always, clumped together and sought the source of the calls. Some group sizes were obtained as members either entered or left their communal roost.

Environmental changes

The residential areas of Little Legon, Legon Hill, Lower Hill, East Legon and Ayido Valley had changed little since the 1970s but since 1993 further residential areas, not shown in Fig. 2, have been built south of Little Legon. Open grassland existed between most of the houses, though some areas, *e.g.* between Ayido Crescent and Ayido Valley, were covered with thicket, mainly Neem *Azadirachta indica* saplings, and shrikes no longer occurred there. Most gardens had a scattering of shrubs and or trees and those on the periphery of the campus had small plantations of cassava and clumps of banana and paw-paw trees. All roads were lined with trees originally planted in the 1950s, and these were more than twice their 1970s height and their canopies were often continuous.

Since 1993, other student residences have been built on land south of the main campus and between East Legon and South Legon, and several faculties have had extra buildings erected mainly on the north side of University Avenue, which runs from east to west and bisects the main campus (Fig. 2). Several new buildings were under construction when I arrived. During my stay extensions to the Balme Library were started and plans for a new Physics laboratory were well advanced. Thus in the last decade up to 20 ha of ground have been cleared of vegetation formerly consisting mainly of grass and thicket with scattered trees.

The factor that has had the most effect on the environment has been the increase in student numbers, particularly in the last decade. Numbers totalled 2360 in 1971–2 and the average rate of increase was just under 90 per year during that decade. It then averaged 200 per year in the 1980s, 1000 per year in the 1990s, and > 4000 per year in 2002 and 2003. The student population at the beginning of the 2004 academic year was 24,876. In addition, the increase in noise level due to the extra traffic and student numbers (5–6 to a room compared with a maximum of two in the early 1990s) was marked.

The number of vehicles on the campus increased in step with student numbers and a continuous flow of traffic occurred throughout the day on most of the campus roads, especially those connecting faculties and student residences (Fig. 2). Cars were parked under any convenient shade tree, some of which were used unsuccessfully as nest

sites by the shrike. A thriving market with additional public transport facilities covered the 1970s territories of Groups 12 and 13, and these were no longer suitable for shrikes.

Tracks that provided short cuts between lecture rooms and accommodation blocks, criss-crossed the campus everywhere and the grass cover in the central campus was minimal, particularly on the north side of University Avenue. In addition, most areas between the annexes were bare of grass due to their overuse as football pitches. Plastic bag and bottle litter did not exist in the 1970s but was now a major concern. In addition, food stalls, which provided an alternative food supply to that supplied by residential halls, were set up each day and contributed to the general pollution.

Results

In spite of the environmental degradation of the central section of the campus, the Yellow-billed Shrike was widespread throughout (Fig. 2). Of the 33 groups located, the positions of 21 (Groups 1–11, 14–20, 23–25, coloured white in Fig. 2), coincided essentially with those found in the 1970s and have, therefore, been numbered the same as in the 1970s. The other 12 are coloured grey in Fig. 2. The areas occupied by the 1970s Groups 12, 13, 21 and 22 were visited on several occasions but no shrikes were found, and these numbers are not used in Fig. 2. The area east of Ayido Crescent, which was part of the 1970 territory of Group 3, was overgrown with Neem in 2004 and it has been assumed that Group 3 moved across the Legon road and annexed part of the 1970 territory of Group 1.

No estimates of the size of Groups 2, 6, 23, 24, 27 and 32 were possible. The maximum number of shrikes recorded in the other 27 groups on the campus ranged from four to 15 (Table 1). The average maximum number per group for the 17 groups that occupied 1970s areas (white in Fig. 2) was 9.47 ± 2.84 (SD) birds and that for the ten grey groups was 8.30 ± 3.26 birds. These are not statistically different.

Table 1. Maximum numbers of Yellow-billed Shrikes recorded in 27 groups from late January to late April 2004. Group identifier numbers in parentheses (Fig. 2).

Maximum birds	Number of groups	Maximum birds	Number of groups
4	2 (10, 33)	10	4 (4, 16, 19, 29)
5	1 (26)	11	1 (25)
6	2 (9, 34)	12	3 (5, 14, 18)
7	4 (1, 3, 30, 37)	13	2 (20, 31)
8	5 (7, 8, 15, 17, 35)	14	1 (28)
9	1 (36)	15	1 (11)

Of the 33 groups found on the campus, 21 laid one or more clutches prior to and during the three months of my stay (details in Appendix 1). Nests were built by ten other groups but no eggs were laid in these as far as it was known (Appendix 1). Of these ten, those built by Groups 7, 17, 20 and 37 were abandoned through unknown factors, those of Groups 31 and 32 through building construction, those of Groups 10 and 27 through disturbance due to road traffic and those of Group 6 and 33 through student activities. No nests were found for Groups 16 and 23. It is likely that several of these groups bred successfully later in the breeding season, which lasts until September in some years (Grimes 1980). There was evidence that a second female competed unsuccessfully for breeding status in groups 14, 19 and 28 (see Grimes 1980 p. 181 and Appendix 1).

Groups 14, 15, 19 and 25 built nests very close to University buildings and fledglings were raised in all of them despite the disturbance from students. Outdoor tutorials were regularly held within 5 m of the nest of Group 19. The nests of Group 25 were within 10 m of a student residence, and the shrikes foraged and fed fledglings within the inner quadrangles of the crowded hall. Those of Groups 14 and 15 were in close proximity to two major thoroughfares, which were used throughout the day.

Discussion

Both the number of shrike groups and the total population of shrikes on the University campus had increased since the 1970s but the timing and rate of increase are unknown. A census in March 1973, when there were 23 shrike groups on the campus, yielded an average of 12 per group giving an estimated total population of 276 shrikes (Grimes 1980 p. 174). The corresponding data for 2004 are 33 groups and 297 shrikes: an average of 9 per group.

Both pollution of the environment and infrastructure development have occurred at Legon since the 1970s, particularly in the last two years, but to a far lesser extent than in areas of the Accra plains that adjoin the campus. In the 1970s and 1980s, grassland, thicket and scattered trees surrounded the campus but these have now been replaced by housing and the campus is effectively a vegetation oasis in a sea of urban development. Some shrike groups therefore may have moved from the plains into the campus as the surrounding areas have been urbanised. However, shrike groups still occur on the Accra plains around Abokobi (8 km north of Legon) and towards Kwabenya (8 km northwest of Legon), and in the older residential suburbs of Accra and in hotel gardens near the International Airport (5 km to the south). As the territories of Groups 12, 13, 21 and 22 became uninhabitable they may have moved into the main campus or else dispersed and joined other groups but their histories are not known. The data suggest that the population of Yellow-billed Shrikes on the campus have been little affected so far by the building programme and the explosion in student numbers. That the number of clutches (21) found in 2004 compares

favourably with those found in the same period in the 1970s (14 in 1970, 17 in 1971 and 1972, 23 in 1973 and 22 in 1974) would support this conclusion.

Although the difference between the mean maximum number of shrikes in the old territories and the newer territories was not statistically significant, their breeding success may be different. In addition, the increase in the number of groups might reduce the overall breeding success of the population from that in the 1970s. The breeding data gathered in this study were insufficient to address these questions.

Acknowledgments

I thank the Registrar of the University of Ghana for permission to adapt the map of the campus that appears in the booklet *University of Ghana* published in 1993. Dr Frank Walsh read and helpfully commented on an earlier draft and George and Rene Dako kindly supplied the tree names.

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Appendix 1

Territorial interactions and breeding success of groups of Yellow-billed Shrike at Legon, Ghana, in 2004.

Little Legon

Group 1. Territorial interactions with Gp 3 observed regularly. Dependent fledglings most of Mar, suggests laying Jan.

Group 2. Nest with five eggs in bamboo, 8 Mar; two eggs and two young, 17 Mar. Following heavy rain, nest empty, 21 Mar. Eggs laid late Feb to early Mar.

Group 3. Territorial interactions with Gps 1 and 2. Two fledglings about to leave nest, 27 Jan. Second nest under construction in another Neem tree, 8 Mar. Four eggs 21 Mar; four nestlings *c.* 1 week old, 2 Apr; two fledglings, 18 Apr.

Group 26. Dependent fledglings, 3 Apr. This group possibly linked with Gp 27.

Group 7. Interactions with Gp 8. Nest in bamboo thicket, female regularly called from it throughout Feb.

Group 8. Interactions with Gp 7, Feb–Mar. Dependent fledglings throughout Feb and early Mar.

South side of Legon Hill

Group 5. Dependent fledglings, 12 Feb, being fed while female was involved with a new nest. Fledglings from latter nest, 25 Mar. Female calling from a new nest placed high in Copper Pod tree *Peltophorum pterocarpum*, 27 Mar.

Group 6. Nest in a grove of Neem trees, female called regularly from it throughout Feb–Apr. Locality unusual, as grass was long and trees quite dense.

Group 20. Territorial interactions with Gps 18 and 30. Female called from nest in tree on lower slopes of hill, 25 Mar, but this was not located.

Group 28. Female called from nest in bamboo clump, late Jan, but this was abandoned when some shoots were cut down. A second nest was built in Copper Pod tree c. 30 m from the bamboo, and female called throughout Feb and into Mar. Nestlings present mid-Mar; left the nest 12 Apr. Whilst fledglings were being fed, 13 Apr, the breeding female built a third nest in the same Copper pod tree and called from it throughout the rest of my stay.

Whilst the breeding female was incubating, a second female began calling on 5 Mar from a nest in a *Tabebuia mimosa* tree, c. 100 m north of the Copper Pod tree. Perhaps competing for breeding status within the group, she called daily from this nest until 22 Mar, then abandoned the site.

Group 29. Interacted with Gp 4. Dependent fledglings, 30 Jan; still being fed, though infrequently, 3 Mar. Female called regularly from nest in Neem tree throughout Feb, Mar and up to 14 April. First egg laid 7 Apr but nest empty 9 Apr.

Group 30. First nest found late Jan but abandoned due to disturbance. A second built in a Candle *Zanthoxylum xanthoxyloides* tree, 18 Feb; three eggs, 4 Mar; one 7 Mar; none 8 Mar, but nest still used by female throughout Mar; one egg in same nest, 26 Mar; three 28 Mar; four 31 Mar; all hatched by 15 Apr. Period between laying of first egg and hatching of first egg, 17 days.

Volta Basin group

Group 19. Territorial interaction with Gp 25. Nearly independent fledglings, 25 Feb; empty nest in a Frangipani *Plumeria* bush next to University Avenue. Two fledglings, barely able to fly, 5 Mar, but nest not found. New nest built in bamboo clump c. 50 m from first nest, 6 Mar, some material taken from the first nest. Three noisy nestlings, 7 Apr; left nest, 15 Apr. From late Jan, a second female called from a nest in a Candle Tree, 26 Jan, c. 30 m from the bamboo clump; continued to do this throughout Feb–Mar, though less frequently, and again in Apr. A fledgling seen on 5 Mar was found the next day at the base of this Candle Tree. Adult shrikes fed it while this second female called from her nest and was visited and fed by adult shrikes. Probably represents a female competing for breeding status within the group.

Halls of Residence group

Group 25. Three small fledglings, 8 Feb and throughout Feb–Mar. New nest built early Mar. Two fledglings c. 1 week out of nest, 11 Apr.

Lower Hill groups

Group 4. Two fledglings, *c.* 1 week out of nest, 31 Jan; still being fed 29 Feb.

Group 24. Fledglings Mar.

Mensah Sarbah Hall group

Group 33. Nest in large *Ficus* tree, 19 Feb. Female called from nest during the rest of Feb and early Mar but abandoned probably due to disturbance from soccer games regularly played nearby. Female called from new nest in *Anogeissus leiocarpus* tree *c.* 30 m from *Ficus* tree, mid-Mar to early Apr but again abandoned. A third nest, in a more remote *Cassia* tree, was used throughout the rest of my stay.

Primary School compound

Group 9. Interactions with Gp 27. Nest in Copper Pod tree near edge of ring road, 19 Feb. Two fledglings, 25 Feb. Three days later, female began building a new nest in a Copper Pod tree *c.* 15 m from first tree. Regularly called from this nest throughout Mar and into Apr.

Group 27. Interactions with Gp 9. Female used nest in Copper Pod tree from third week of Feb to early Mar before abandoning it through disturbance from traffic and school children. Second nest built mid-Apr.

East Legon

Group 10. Nest in Copper Pod tree, 6 Feb. Female called from it throughout Feb to late Mar, but abandoned due to disturbance from traffic.

Group 11. Interactions with Group 14. Two noisy fledglings throughout Feb were still begging 19 Mar but not in Apr.

Physics/Geology/Geography/Balme Library

Group 14. Territorial disputes with Gp 32. Female called from nest in a Mahogany *Khaya senegalensis* tree, 6 Feb. Fledglings, *c.* 1 week out of nest, 23 Mar. Same fledglings, 30 Mar, within 2 m of the tree in which a second female had built a nest and probably was competing for breeding status. First female called from new nest *c.* 30 m west of the first one, late Mar and into Apr. Construction of nest by competing female started 26 Mar and she called regularly from it during the rest of my stay. She was often fed on the nest.

Group 31. Female called from nest in Copper Pod tree at NE corner of University Library in late Jan. Abandoned through disturbance from construction work. Second nest built in a Copper Pod tree, early Feb, but abandoned by 20 Mar. A third nest started on 21 Apr.

North of Commonwealth Hall, Balme Library and Science departments

Group 15. Dependent juveniles throughout Mar and early Apr.

Group 16. Interacted with Gp 32, Feb–Mar.

Group 18. Interacted with Gp 20. Female called from nest in *Tabebuia pentaphylla* throughout Mar and early Apr; fledglings, 12 Apr.

Group 34. Interactions with Gp 18. Fledglings, c. 1 week old, late Jan; with adults throughout Feb.

Group 32. Interacted with Gp 16. Female called from nest throughout early Mar. Construction of a new block of offices was continuous during this period and nest was abandoned.

Botanical Gardens

Group 17. Interactions with Gp 37, late Jan–Feb. Nest in a low branch of Silk Cotton *Ceiba pentandra* tree being built mid-Apr.

Group 37. Possibly same as Gp 32. Interaction with Gp 17, late Jan. Female called from nest in bamboo clump, late Jan and early Feb.

Group 35. Nest built in *Bougainvillea* shrub, early Feb; two eggs 20 Mar; five 24 Mar. Nest failed. New nest in bamboo thicket at the W edge of the gardens, 16 Apr, also abandoned. Third nest started in another *Bougainvillea* clump, 22 Apr.

Group 36. Female called from nest in *Gliricidia sepium* tree, end of Jan. Young fledglings, 10 Apr.

Short Notes — Notes Courtes

Observations at a Scarlet-chested Sunbird *Chalcomitra senegalensis* nest

The solitary nesting, monogamous and territorial Scarlet-chested Sunbird *Chalcomitra senegalensis* is commonly double-brooded or sometimes treble-brooded and usually builds a new nest for each brood (Fry *et al.* 2000). The female builds the nest and may take 3–6 days (Fry *et al.* 2000). Nests are usually found in borders of woodland and open ground, often near or over water, and commonly in thickets of bushes and small trees growing on *Macrotermes* termite mounds (Fry *et al.* 2000). Many different tree species are used, with the nest suspended from a twig (Fry *et al.* 2000, Cheke & Mann 2001). The species is a common resident in Nigeria (Elgood *et al.* 1994). In Ilorin, two to three broods were raised in the same nest from March to October, while in another case at Jos, the broods were at six-month intervals (Elgood *et al.* 1994).

On 19 Mar 2004 we found a nest of this species suspended from an electric lamp holder outside the main building of the A.P. Leventis Ornithological Research Institute (9°53'N, 8°59'E), in Amurum Forest Reserve, Laminga, Plateau State, Nigeria. It was oval, made of grass, dry leaves and woolly strands, with the entrance at the side-bottom. Observations were made from the ground on most days in the periods 19 Mar to 1 May, 24 May to 4 Jun, 11–18 Aug and 31 Aug to 2 Sep, with occasional observations between these dates, totalling 82 h of observations. We climbed to check inside the nest at 1–7 day intervals during these observation periods.

When we first found the nest, on 19 Mar, the female made repeated visits, collecting materials to thicken the walls; this continued for about seven days, during which period the male visited the nest only twice, the second visit being on the last day the female brought materials, when male and female arrived together. On 29 Mar the nest was still empty. On 5 Apr, a warm egg was discovered in the nest, suspected to have been laid between 31 Mar and 4 Apr, because from 31 Mar to 13 Apr, the time intervals that the female spent in the nest ranged between 11 and 63 min., compared to 3–16 min. between 14 and 30 Apr. The egg hatched between 06h00 12 Apr and 06h00 13 Apr. Both parents fed the chick. The chick stuck out its head 28 and 30 Apr, and fledged 30 Apr or 1 May, as neither adults nor chicks were present on 1 May.

The sunbirds then disappeared for about three weeks until a female was seen leaving the nest on 24 May. Two eggs were found already being incubated. On 3 Jun, two chicks were found in the nest. Both parents fed the chicks, which were still present on 15 June. The nest was empty on 18 June.

The sunbird had already started feeding two more chicks when regular observation started for the third brood, on 11 Aug. Feeding continued until 2 Sep when the chicks fledged. Thus the chicks remained in the nest for at least 23 days, three days longer than the maximum quoted by Cheke & Mann (2001).

The same nest was used for all three broods, with an interval of three weeks between the first and second brood and six weeks between the second and third. We believe that the same parents were involved in all three.

This study was funded by the A.P. Leventis Foundation. Many thanks to Martin Stervander for reading the manuscript. The kind assistance of Martha Samuel and Jonathan Azi, who took part in field observation, is also highly appreciated. This is report no. 14 from the A.P. Leventis Ornithological Institute.

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Received 19 May 2005

Revised 13 September 2005

Mary Molokwu, Ulf Ottosson & John Azi

A.P. Leventis Ornithological Research Institute,

University of Jos, PO Box 13404, Jos, Plateau State, Nigeria

<mm04ng@yahoo.com>

Rufous Scrub Robin *Cercotrichas galactotes* at Fusa Hills, Plateau State, Nigeria

On 10 Apr 2005, during a trek into the Fusa Hills range in the Jos East local government area of Plateau State, Nigeria, a Rufous Scrub Robin *Cercotrichas galactotes* was sighted and photographed at about 9h00 near Kudedu village (9°51'45''N, 9°4'25''E), c. 25 km southeast of Jos. The bird was plain sandy rufous-brown above, with plain sandy-white underparts, rufous rump, and fan-shaped rufous tail boldly tipped black and white, with a creamy-white supercilium bordered below by a narrow blackish eye-stripe (Borrow & Demey 2001). It was gathering grass stems and other nesting materials into a crevice c. 1.5 m from the ground in the straw fence of a hut. No attempt was made to approach the bird or nest.

This is the first sighting of this species on the Jos plateau (U. Ottosson & M. Hopkins pers. comm.). There are two distinct subspecies in Nigeria: the migratory nominate *galactotes* and the resident *minor* (Elgood *et al.* 1994, Keith *et al.* 1992). The observed bird is believed to be the resident *C. g. minor* (as shown by the nest

building), with a southern limit in Nigeria hitherto placed at Zaria (Elgood *et al.* 1994) c. 180 km northwest of Jos.

We are grateful for the support of Thomas de Douhet and Yves Gattepaille of Padakari during the trek, as well as the guidance of Dr Ulf Ottosson and Dr Mark Hopkins. This is Contribution 13 of APLORI.

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Received 10 June 2005

Temidayo Osinubi & Babajide Agboola
A.P. Leventis Ornithological Research Institute,
PO Box 13404, Laminga, Jos, Plateau State, Nigeria. <taymida@yahoo.co.uk>

A sight record of the Brown Nightjar *Caprimulgus binotatus* in Nigeria

On the evening of 1 Mar 2002, a truck in which I was riding flushed a nightjar from the road near the village of Iko Esai, Cross River State, Nigeria. The bird settled again farther down the road and we were able to approach it closely (to about 8 m) and study it in the beam of the headlights for several minutes before it flew off.

The bird was small and very dark uniform brown above, with slightly paler underparts, a buff or off-white line on the scapulars, and a small white patch on the side of the throat. The tail was not especially long or short. In flight it showed no pale wing patches or tail corners, and the tail seemed to have a square or slightly forked tip.

Identification of nightjars by sight, especially under artificial light, is usually problematic, but in this case it was relatively straightforward. The combination of small size, dark, unvariegated coloration and lack of white in the flight feathers is diagnostic of Brown Nightjar *Caprimulgus binotatus*, a poorly known forest species not previously recorded in Nigeria (Fry *et al.* 1988, Elgood *et al.* 1994, Cleere & Nurney 1998, Borrow & Demey 2001, P. Hall pers. comm.). There are no similar species (Cleere & Nurney 1998). Although I did not see the small "ear tufts" or the "tent" shape of the tail that this species is supposed to have, and the bird did not vocalize, all other nightjars of the region could be eliminated on the basis of

coloration and habitat (forest edge in a largely forested landscape). Only a few other W African nightjars (all described below) lack pale wing patches. The female Bates's Nightjar *C. batesi*, the only other African rainforest nightjar is much larger, with more variegated plumage, and also unrecorded from Nigeria (Fry *et al.* 1988, Cleere & Nurney 1998, Borrow & Demey 2001). The female Eurasian Nightjar *C. europaeus* is a greyer bird of more open habitats and not normally found in SE Nigeria (Elgood *et al.* 1994, Borrow & Demey 2001). Egyptian Nightjar *C. aegyptius* is a pale grey species of arid habitats and unrecorded in S Nigeria (Elgood *et al.* 1994, Cleere & Nurney 1998, Borrow & Demey 2001). Standard-winged Nightjar *Macrodipteryx longipennis* is paler, has a broad rufous nuchal collar, and inhabits open savanna and farmland (Elgood *et al.* 1994, Cleere & Nurney 1998, Borrow & Demey 2001). The female Pennant-winged Nightjar *M. vexillarius* is a paler, slightly larger, grassland and open woodland species, also with a rufous nuchal collar, and not recorded in Nigeria before April (Elgood *et al.* 1994, Borrow & Demey 2001).

Brown Nightjar is thought to have a patchy distribution in lowland rainforest from Liberia to N Gabon and central Congo (Cleere & Nurney 1998, Clements 2000, Borrow & Demey 2001). There is a known population in W Cameroon extending more or less to the Nigerian border, within 80 km of Iko Esai (Borrow & Demey 2001). It is recorded from Korup National Park (Cleere & Nurney 1998), which is contiguous with Nigeria's Cross River National Park, which in turn is contiguous with the Iko Esai forest. It thus seems reasonable that the range of the above population would extend into Nigeria; in fact, the range map in Cleere & Nurney (1998) suggests that it does so. The mature, if not primary, lowland forests of Cross River State have not been studied extensively by ornithologists (Elgood *et al.* 1994, P. Hall pers. comm.). It is not surprising that a scarce, secretive species such as Brown Nightjar would escape notice until now, and it seems likely that it will prove to be distributed more continuously in mature forest throughout the region.

I wish to thank Cercopan Forest Monkey Rehabilitation and Conservation Centre (now the Centre for Education, Research, and Conservation of Primates and Nature) for facilitating, and providing logistical support during, my visit to Nigeria. Phil Hall offered commentary on my observations and encouraged the writing of this note. Two referees provided helpful suggestions and additional references.

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Received 5 May 2005

Kenneth M. Burton

Revised 19 October 2005

1207 Gassaway Rd, McKinleyville, CA 95519, U.S.A.

<kmburton@sbcglobal.net>

Minimum survival data of some tropical passerine species in Comoé National Park, Ivory Coast

Knowledge of individual life history traits such as longevity is crucial for understanding the population dynamics of birds. There are, however, few long-term studies of tropical passerines in West Africa (*e.g.* Thiollay 1970, 1971, Morel & Morel 1972, Brosset 1990) and therefore hardly any field data on longevity.

During a project on the winter ecology of Palaearctic migrants we mist-netted birds regularly in Comoé National Park, NE Ivory Coast, between mid-September and late April of 1994–5, 1995–6 and 1996–7. Some birds had already been captured during a preliminary study in Feb–Mar 1994. Afrotropical species of selected families assumed to have a similar ecology compared to some Palaearctic migrants in the area were marked either with an aluminium ring or an individual combination of colour rings. Additional mist-netting took place in the northern winters 1997–8 and 2000–1, when no Afrotropical birds were marked but recaptures from the former study were recorded. A separate project also marked birds between 1990 and 1995 (Brendle 1997) although no information about precise ringing dates could be obtained. Some of these birds were captured by us and are also included here. Here, we report minimal survival times indicated by recaptured or observed individuals of 17 Afrotropical passerine species based on these data (Table 1). The minimal survival of an individual is the difference between the first capture and the last record in days. We refrain from calculating survival rates with capture-recapture models because of the low number of recaptured birds, the uneven capture effort at various sites and the combination of different recapture methods (mistnetting vs colour-ring sightings).

Individuals survived up to six years in Grey-headed Bristlebill and Snowy-crowned Robin-Chat. The two individuals with the longest minimum survival were ringed by the previous project and could therefore have been up to three years older than indicated by our analyses. Excluding Beautiful Sunbird and Fork-tailed Drongo, of which only three individuals were ringed, encounter rates after at least one year were up to 18% (Northern Crombec) and at least 5% for all species. Encounter rates after at least two years were up to 10% (Puvel's Illadopsis) and after more than three years up to 3% (Snowy-crowned Robin-Chat).

Table 1. Minimum survival of some passerine bird species in Comoé National Park. Minimal survival is the difference (days) between first capture and last record when the difference exceeds one year.

Species (n ringed)	Minimal survival	% still alive after		
		>1y	>2y	>3y
Grey-headed Bristlebill <i>Bleda canicapillus</i> (0)*	2129**	-	-	-
African Thrush <i>Turdus pelios</i> (48)	374, 417, 452, 467, 493, 765	13	2	0
Snowy-crowned Robin Chat <i>Cossypha niveicapilla</i> (76)	453, 653**, 1864, 2247**	5	3	3
Forest Scrub Robin <i>Cercotrichas leucosticta</i> (9)	459	11	0	0
Senegal Eremomela <i>Eremomela pusilla</i> (52)	365, 366, 376, 395, 410, 515, 749, 1022	15	4	0
Northern Crombec <i>Sylvietta brachyura</i> (17)	366, 436, 471	18	0	0
Grey-backed Camaroptera <i>Camaroptera brachyura</i> (168)	451, 476, 480, 579, 593, 628, 840, 2019	5	1	0.6
Pale Flycatcher <i>Melaenornis pallidus</i> (22)	497	5	0	0
Lead-coloured Flycatcher <i>Myioparus plumbeus</i> (13)	791	8	8	0
Red-bellied Paradise Flycatcher <i>Terpsiphone rufiventer</i> (66)	367, 399, 460, 484, 488, 629, 659, 715, 730, 825, 1003, 1128	18	6	1.5
African Blue Flycatcher <i>Elminia longicauda</i> (18)	1062	6	6	0
Senegal Batis <i>Batis senegalensis</i> (43)	770, 878, 1375	7	7	2
Common Wattle-eye <i>Platysteira cyanea</i> (58)	451, 563, 713, 747, 852, 1003, 1156	12	7	2
Puvel's Illadopsis <i>Illadopsis puveli</i> (20)	500, 504	10	10	0
Yellow White-eye <i>Zosterops senegalensis</i> (14)	385	7	0	0
Beautiful Sunbird <i>Cinnyris pulchellus</i> (3)	730	33	33	0
Fork-tailed Drongo <i>Dicrurus adsimilis</i> (3)	759	33	33	0

* None marked during the present project.

** Birds from previous project captured (see text).

These are the first published data on minimum survival in West Africa for many of the listed species. Similar data for a few of these species are available from Lamto, Ivory Coast, where Thiollay (1971) recorded recaptures after at least six years for Snowy-crowned Robin-Chat (one out of seven ringed), Grey-backed Camaroptera (one out of three) and Common Wattle-eye (one out of four), while the proportion of birds recaptured after *c.* 2.5 years was 38% for Grey-headed Bristlebill ($n = 8$), 20% for Snowy-crowned Robin-Chat (5), 43% for Grey-backed Camaroptera (7) and 40% for Common Wattle-eye (5) respectively (after Table 10 of Thiollay 1971). Therefore, with a smaller sample, Thiollay (1971) recaptured a much higher proportion of birds compared to our analysis after the comparable two years. However, our results are probably biased by irregular capture effort and show minimal survival times which might be in fact much higher.

The Ministère des Eaux et Forêts de la Côte d'Ivoire gave permission to work in Comoé National Park and K.E. Linsenmair allowed us to use the camp of the University of Würzburg. S. Eggers, K.H. Falk, J. Fry, F. Göken, K. Kouadio, A. Kouakou Kouadio, Lakado, G. Nikolaus, L. Pommerencke, S. Schmidt, D.v. Stünzner-Karbe, D.T. Tietze and K.P. Yoa helped with mist-netting. P. Jones gave useful comments on the manuscript. The study was supported by the Deutsche Forschungsgemeinschaft and Volkswagen AG.

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Received 25 November 2005

Volker Salewski¹, Franz Bairlein¹ & Bernd Leisler²

¹Institut für Vogelforschung "Vogelwarte Helgoland",
An der Vogelwarte 21, 26386 Wilhelmshaven, Germany

²Max-Planck-Institut für Ornithologie, Vogelwarte Radolfzell,
Schlossallee 2, 78315 Radolfzell, Germany

News & Letters — Nouvelles & Lettres

Index to *Bulletin of the African Bird Club*

I have prepared an index for volumes 1–12 (1994–2005) of *Bulletin of the African Bird Club*. It is available as a pdf file, free on demand, from <dowsett@aol.com>.

R.J. Dowsett

£500,000 fund to connect African ecologists

Scientists in Africa can now seek support from a new fund to help them research major challenges, such as climate change, desertification and biodiversity loss. The British Ecological Society's "Building Capacity for Ecology Fund", launched in January 2006, will develop ecological science in the region by helping create national and regional associations of scientists studying African ecology. BES has committed £500,000 for the first five years. This will be used, in part, to bring scientists together, and to provide administrative support to newly-formed associations in their first couple of years. Full details and an application form for the Building Capacity for Ecology Fund are available at <www.britishecologicalsociety.org/grants/bcef>.

Alan Tye

Reviews — Revues

Floodplain Rehabilitation and the Future of Conservation and Development. Adaptive management of success in Waza-Logone, Cameroon, by P. Scholte, 2005. 344 pp. incl. 32 col. plates. Tropical Resource Management Papers 67, Wageningen University and Research Centre, Wageningen. ISBN 90-6754-953-3, paperback, €15. Available from the author <scholkerst@cs.com> and online at <http://www.leidenuniv.nl/cml/bieb_internet/dissertations.html>.

This is the published version of the author's Ph.D. thesis from Leiden University. However, its relevance is far broader than its title and origin might suggest. It is a masterly piece of work about a unique 15-year (so far) project, and both project and book contain enormously important lessons for conservationists.

Scholte has worked in the Waza-Logone area of N Cameroon since 1990, mainly on the far-sighted floodplain rehabilitation project. This book is mainly about that project but also places it in a global context, and deals comprehensively with related subjects of intense interest to the challenge of making conservation work in Africa, such as the roles of training and of community involvement. The project is of immense importance as the first large-scale attempt to rehabilitate a semi-natural floodplain following severe degradation caused by ill-planned hydrological changes. In this case, construction of a road, and of a dam for an irrigated rice scheme, cut off the annual flood in 1979, from 1500 km² of the floodplain, which includes the Waza National Park as well as fertile grazing and fishing grounds. This resulted in severe vegetation degradation, rapid declines in wildlife and hardship to local fishermen and pastoralists, all very well documented. The rice scheme failed, creating a rare opportunity for rehabilitation, with almost all interested parties in favour. A pilot reflooding of 400 km², begun in 1994, demonstrated rapid regeneration of perennial grassland, rebound in wildlife populations and improvements to cattle grazing and fisheries. Not all elements came back equally, nor to pre-dam levels, so predictions are made for the future progress of the regeneration. The fishermen and cattle recovered faster than the vegetation and wildlife, indicating a need to build in adequate controls to prevent over-use. Reflooding increased grazing intensity, and the rate of incursions by pastoralists into Waza NP did not clearly fall, which was one desired outcome. This could eventually destroy the gains of reflooding unless controlled. Local communities can be given incentives to defend these rich resources, such as by implementing immigration controls, but these experiences strongly indicate a need for conservation and development projects such as this to think regionally, rather than creating, by means of local development alongside a conservation area, honey-pots which draw people in from surrounding under-privileged areas, thereby increasing pressure on the area which the project seeks to conserve. The study highlights the need to incorporate a protection element, too often

forgotten in simplistic applications of the conservation-and-development approach, with park guards or other authorities enforcing both national and local rules.

Several of the book's 12 chapters have been published or are in press as journal articles, while other aspects of the author's comprehensive studies in Waza-Logone have been published elsewhere, including in *Malimbus* (21: 16–50; 22: 29–31). Chapter 1 gives a general introduction and demonstrates the unprecedentedly comprehensive nature of the studies undertaken, including reviews of pre-dam surveys in the well-studied Waza area, and detailed investigation of the effects of the dam on vegetation, wildlife, grazing and fisheries, which demonstrate conclusively the ecological and social disaster it caused. The point is made that this project succeeded in part because it attempted to re-establish natural and traditional use, whereas most failed conservation-and-development projects have sought to establish new developments. There is a 32-page section that tells the book's story very effectively in colour photographs and captions. Chapter 2 outlines the human and environmental history of the area, and chapters 3–7 examine the effects of the reflooding on vegetation, waterbirds, antelope and pastoralists. Chapter 8 looks at the risks of success—development increasing pressure on natural resources—while 9 considers the success of the consensual management planning approach and emphasises the importance of regional planning. Chapters 10 and 11 review training at the three African colleges of wildlife management, especially at Garoua, where the author taught for some years. Chapter 12 is an excellent synthesis, marred only by the abstract and not-very-useful analysis in incomprehensible development-speak.

My main criticisms reflect the book's origin as a thesis and separate papers: repetition of introductory material; too many near-identical maps but none at the beginning to show all main features mentioned; a confusing use of “years” related to the flood cycle, where “Feb 1991” might actually mean “Feb 1992”, which might have been useful to the author but should have been changed for publication. The English is poor in some sections, despite the author's attempts to get the text proofed by native English-speakers: they let him down in places, resulting in ambiguities or occasionally incomprehension. But these should not stop anyone reading the book.

The whole book is in effect a balanced review of the pros and cons of the old conservation “protection” and the more recent “integrated conservation and development” approaches. The latter is criticised where criticism is due, especially for its simplistic reliance on development carrots and neglect of the need for regulation, or even neglect of the conservation *raison d'être* of the project. The supreme importance of majority community approval for conservation projects, regional planning, and protection against abuse are emphasised, and other conclusions and recommendations are carefully considered and sensible. Given that these recommendations come from a success story, they should be taken very seriously.

This book should be required reading for all conservation scientists and managers.

Alan Tye

Society Notices — Informations de la Société

WAOS Website

In 2004, Council decided to make the full text of *Malimbus*, except for the most recent three years, available on the website (<http://malimbus.free.fr>). Visitors can download pdfs of complete issues. Recently, an alternative method of accessing the full text has been introduced. Visitors can now view, download and print individual pages of *Malimbus*.

Also available are three pointers to individual *Malimbus* pages. The species index, the tables of contents and the country references are visible on the screen simultaneously with the *Malimbus* page. Hence, researchers interested in particular species, or particular locations or countries, or particular articles, can see, download or print the relevant *Malimbus* pages. This new feature is unique in African ornithology and an important research tool.

Not all years are yet online, but it is intended to cover volumes 1–24 during 2006. Because there may be “bugs” in this new system, users are encouraged to let the Webmaster know of any difficulties encountered, or any suggestions for improvement.

Peter Browne

Webmaster <pbrowne@cyberus.ca>

Site web SOOA

En 2004, le Conseil a décidé de rendre le texte intégral de *Malimbus*, sauf pour les dernières années, disponible sur le site Web (<http://malimbus.free.fr>). Les visiteurs peuvent télécharger des numéros complets au format pdf. Récemment, un autre moyen d'accès au texte complet a été introduit: les visiteurs peuvent ainsi consulter, télécharger et imprimer des pages au choix de *Malimbus*. Disponibles sont aussi les trois pointeurs aux pages désirées de *Malimbus*. L'index des espèces, les tables des matières et les références par pays sont visibles sur l'écran en même temps que la page de *Malimbus*. Ainsi, les chercheurs intéressés par une espèce, un endroit, un pays ou un article particulier peuvent voir, télécharger ou imprimer les pages correspondantes de *Malimbus*. Cette nouvelle disposition est unique en ornithologie africaine et constitue un important instrument de travail. Toutes les années ne sont pas encore en ligne mais c'est notre dessein de traiter les volumes 1–24 au cours de 2006. Comme ce nouveau système peut avoir des bogues, les utilisateurs sont priés de faire savoir au Webmestre toute difficulté rencontrée ou toute idée d'amélioration.

Peter Browne

Webmestre <pbrowne@cyberus.ca>

**West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain**

Revenue Account for the year ended 31 December 2005

Income		<u>2004</u>
Subscriptions, donations and back numbers	£3034	£2051
Interest	<u>96</u>	<u>103</u>
	<u>£3130</u>	<u>£2154</u>
Expenditure		
Malimbus production and distribution	£3268	£1195
WAOS Research Grants	638	1013
Council expenses	<u>0</u>	<u>81</u>
	3906	2289
Deficit for year	<u>776</u>	<u>135</u>
	<u>£3130</u>	<u>£2154</u>

Balance Sheet as at 31 December 2005

Assets		
Bank balances	£6431	7207
Less subscriptions paid in advance	<u>225</u>	<u>225</u>
	<u>6206</u>	<u>6982</u>
Accumulated funds		
Balance at 1 January	£6982	£7117
Less deficit for year	<u>776</u>	<u>135</u>
	<u>£6206</u>	<u>£6982</u>

These Accounts include transactions in Euro converted at the rate of €1.3 = £1.

R.E. Sharland, Treasurer

Certified that I have verified the Society's bank balances.

G.D. Field

Instructions to Authors

Malimbus publishes research papers, reviews and news about West African ornithology.

Papers and **Short Notes** must be original contributions; material published elsewhere, in whole or in part, will not normally be accepted. Short Notes are articles not exceeding 1500 words (including references) or three printed pages in length. Wherever possible, manuscripts should first have been critically scrutinised by at least one other ornithologist or biologist before submission. Manuscripts will be sent for critical review to at least one relevant authority.

Items for **News & Letters** should not exceed 1000 words.

Contributions are accepted in English or French; editorial assistance will be made available to authors whose first language is not one of these. Submission by email (attached file) is preferred. For submissions on paper, two copies are required, typed on one side of the paper, with double spacing and wide margins. Consult the editor for further details, *e.g.* acceptable software.

All Papers (but not Short Notes) should include a **Summary**, not exceeding 5% of the paper's length. The Summary should include brief reference to major findings of the paper and not simply review what was done. Summaries will be published in both English and French and will be translated as appropriate by the Editorial Board.

Format of tabular material, numbers, metric units, references, *etc.* should match recent issues. Note particularly: dates are written 2 Feb 1990 but months standing alone may be written in full; times of day are written 6h45, 17h32 and coordinates in the form 7°46'N, 16°4'E (no leading zeros); numbers up to ten are written in full, except when followed by abbreviated units (*e.g.* 6 m), numbers from 11 upwards are written in figures except at the beginning of a sentence. All references mentioned in the article, and only such, must be listed in the bibliography.

Avifaunal articles must contain a map or gazetteer, including all localities mentioned. They should include brief notes on climate, topography, vegetation, and conditions or unusual events prior to or during the study (*e.g.* late rains *etc.*). **Species lists** should include only significant information; full lists are justified only for areas previously unstudied or unvisited for many years. Otherwise, include only species for which the study provides new information on range, period of residence, breeding *etc.* For each species, indicate range extensions, an assessment of abundance (*Malimbus* 17: 36) and dated breeding records; indicate migratory status and period of residence only as shown by the study. Where appropriate, set data in context by brief comparison with an authoritative regional checklist. Lengthy species lists may be in tabular form (*e.g.* *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) or in the textual format of recent issues. **Taxonomic sequence** and **scientific names** (and preferably also **vernacular names**) should follow Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), or Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) or *The Birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), unless reasons for departure from these authorities are stated. A **more complete guide for authors** of avifaunal papers, including the preferred abundance scale, appeared in *Malimbus* 17: 35–39; a copy may be obtained from the Editor, who will be happy to advise on the presentation of specific studies.

Figures should be prepared as for final reproduction, allowing for 20–50% reduction. When designing Figures, pay attention to *Malimbus* page-shape. Figures prepared in or scanned into an appropriate graphics package and saved at high resolution are preferred. They should be supplied as graphics files, and not pasted into a text file. Low-resolution files and poor-quality printouts will not be accepted. Authors are encouraged to submit **photographs** that illustrate salient points of their articles. Photographs should be high-contrast (for publication in monochrome) and high resolution (at least 600 dpi). They should be supplied in graphics file format (*e.g.* jpg or tif) and not pasted into a Word file. Consult the Editor for further advice.

Ten **offprints** of Papers (but not of Short Notes) will be sent to single or senior authors, *gratis*. Offprints will not be stapled, bound, or covered; they are merely cut from copies of the journal.

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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain



VOLUME 28 Number 2

September 2006

ISSN 0331-3689

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

Société d'Ornithologie de l'Ouest Africain

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La correspondance doit être adressée comme suit:

- au Rédacteur en Chef (Dr A. Tye, CDRS, Casilla 17-01-3891, Quito, Ecuador; <atye@fcdarwin.org.ec>) pour les articles à soumettre à *Malimbus*,
- au Trésorier (1 Fisher's Heron, East Mills, Fordingbridge, Hampshire, SP6 2JR, U.K.; <bob@sharland2002.fsnet.co.uk>) pour les abonnements, les questions financières et les numéros anciens;
- au Secrétaire du Conseil (Zoological Gardens, Chester CH2 1LH, U.K.; <r.wilkinson@chesterzoo.co.uk>) pour les demandes des Bourses de Recherches;
- au Secrétaire adjoint (BirdLife International, ICIPE Campus, Kasarani Road, P.O. Box 3502-00100, Nairobi, Kenya; <hazell.thompson@birdlife.or.ke>) pour la présence aux réunions ou des suggestions pour celles-ci.
- au Webmestre <pbrowne@cyberus.ca> pour les questions du site web.
- au Président (1 Route de Sallenelles, 14860 Bréville-les-Monts, France; <gjmorel@wanadoo.fr>) pour les questions d'intérêt général.

La Société tire son origine de la "Nigerian Ornithologists' Society", fondée en 1964. Son but est de promouvoir l'ornithologie ouest-africaine, principalement au moyen de sa revue *Malimbus* (anciennement *Bulletin of the Nigerian Ornithologists' Society*).

Les demandes d'adhésion sont les bienvenues. Les cotisations annuelles sont de £10 (€17) pour les Membres Ordinaires et de £25 (€42.50) pour les Sociétés (les cotisations peuvent être payées en £ sterling au Trésorier ou en Euro au Président). Les Membres Ordinaires reçoivent *Malimbus* par courrier ordinaire et les Sociétés par courrier aérien, gratuitement. Un supplément est exigé des Membres Ordinaires pour le courrier aérien (demander au Trésorier le tarif).

Anciens Numéros: Les Volumes 11–14 (1975–78) du *Bulletin of the Nigerian Ornithologists' Society* (du même format que *Malimbus*) sont disponibles à £2/€3.50 par numéro (£4/€7 par volume) ou £15/€25 l'ensemble. Les Volumes 1–9 de *Malimbus* sont disponibles à £3/€5 par numéro (£6/€10 par volume) et, à partir du Vol. 10, à £5/€8.50 par numéro (£10/€17 par volume). On peut acheter la série complète des Vols 1–28 de *Malimbus* au prix spécial de £195/€310. Frais de port et emballage sont gratuits. Veuillez joindre le paiement à votre commande et l'adresser au Trésorier.

Bourses de Recherches de la S.O.O.A.: Les conditions à remplir pour les candidatures se trouvent dans *Malimbus* 25: 72–75 et sur le site web, ou peuvent être obtenues auprès du Secrétaire du Conseil (adresse ci-dessus).

Avifaunal and environmental changes on the campus of the University of Ghana, Legon, between the 1960s and 2004

by Llewellyn Grimes

3 St Nicholas Court, Warwick CV34 4JY, U.K. <lgrimes@freeuk.com>

Received 20 July 2005; revised 29 March 2006.



Summary

Of 111 bird species recorded regularly and annually from late January to late April on the University of Ghana campus at Legon, in the 1960s and 1970s, only 83 were recorded in the same period in 2004. Of these, seven were considered more common and 13 less common than from 1960 to 1975. The environmental changes that have occurred during the intervening years are considered the main reason for the loss of most of the 28 species (24 Afrotropical and 4 Palearctic). Five species not present from 1960 to 1975 were regularly recorded in 2004.

Résumé

Changements dans l'avifaune et l'environnement sur le campus de l'Université de Ghana, Legon, entre les années 1960 et 2004. Sur les 111 espèces d'oiseaux observées régulièrement chaque année de fin janvier à fin avril sur le campus de l'Université du Ghana à Legon pendant les décades de 1960 et 1970, seulement 83 furent observées pour la même période en 2004. Sur celles-ci, sept étaient considérées plus communes et 13 moins communes qu'entre 1960 et 1975. Les changements survenus entre temps dans le milieu sont considérés comme la raison principale de la perte de la plupart des 28 espèces (24 afrotropicales et 4 paléarctiques). Cinq espèces absentes entre 1960 et 1975 ont été régulièrement observées en 2004.

Introduction and methods

I was resident at Legon from 1960 to 1975 and gathered data on the birds found on and in the immediate vicinity of the University of Ghana campus. In 2004 I had the opportunity to return for the period late January to late April, and made daily observations as time allowed.

It is well documented that an increase in pollution and environmental changes and infrastructure development in a locality have direct and indirect impacts on its

avifauna (BirdLife International 2004). Many environmental changes have occurred on the University campus and its environs since the 1970s, particularly in the last decade. As rare or infrequently recorded birds would not be adequate indicators of the effect of environmental changes on a local avifauna subject to relatively limited recent observation, I limited this study to species that were invariably encountered or often found, singly or in numbers, in their preferred habitats at Legon from late January through to end of April in the 1960s and 1970s (taken from Grimes 1987), and that were recorded annually or which bred.

Nomenclature and sequence follow Brown *et al.* (1982), Urban *et al.* (1986, 1997), Fry *et al.* (1988, 2000), Keith *et al.* (1992) and Fry & Keith (2004).

Changes in the environment

In the 1960s, the campus was part of the transition zone between the grass savanna and the thicket zone of the Accra Plains and was surrounded by a mixture of grassland, thicket and scattered trees which characterised the western sector of the plains (Brammer 1967). Some indigenous trees grew on the campus but it was landscaped by mainly exotic species. The suburbs of Accra were beginning to spread northwards and by the mid 1970s had reached the International Airport some 5 km south of Legon. Just 1 km or so north from Legon along the Dodowa road was the village of Madina, and on the plains northeast of Legon the only major construction was the Atomic Reactor and associated staff housing at Kwabenya. Today, in marked contrast, the campus is effectively an island in a sea of urbanisation in which Madina and Kwabenya have been swallowed.

The number of staff bungalows in Little Legon, Legon Hill, Lower Hill, East Legon and Ayido Valley (Fig. 1) had not changed but, since 1993, further residential areas have been built south of Little Legon on land formerly the research site of the Physics Department. An international student hostel has been erected between East Legon and South Legon and other student accommodation has replaced the cricket pitch south of Mensah Sarbah Hall. In the late 1970s several student annexes were built south of Akuafo Hall, Legon Hall and Mensah Sarbah Hall (Fig. 1) and the areas in between converted to playing fields, which through over use were in 2004 bare of grass. In addition, some science faculties erected extra buildings, mainly on the north side of University Avenue (Fig. 1) and several new buildings were under construction in 2004. Extensions to the Balme Library were started in early February and plans for a new physics laboratory were well advanced by the time I left.

Notwithstanding these developments, the campus was an oasis of relatively lush vegetation. All roads were still lined with trees planted in the 1950s, e.g. Copper Pod *Peltophorum pterocarpum* along the Estate and Akuafo Roads, *Millingtonia hortensis* along the roads leading into Lower Hill, Mahogany *Khaya senegalensis* along the University Avenue and *Tabebuia mimosa* trees, infected with mistletoe, along roads

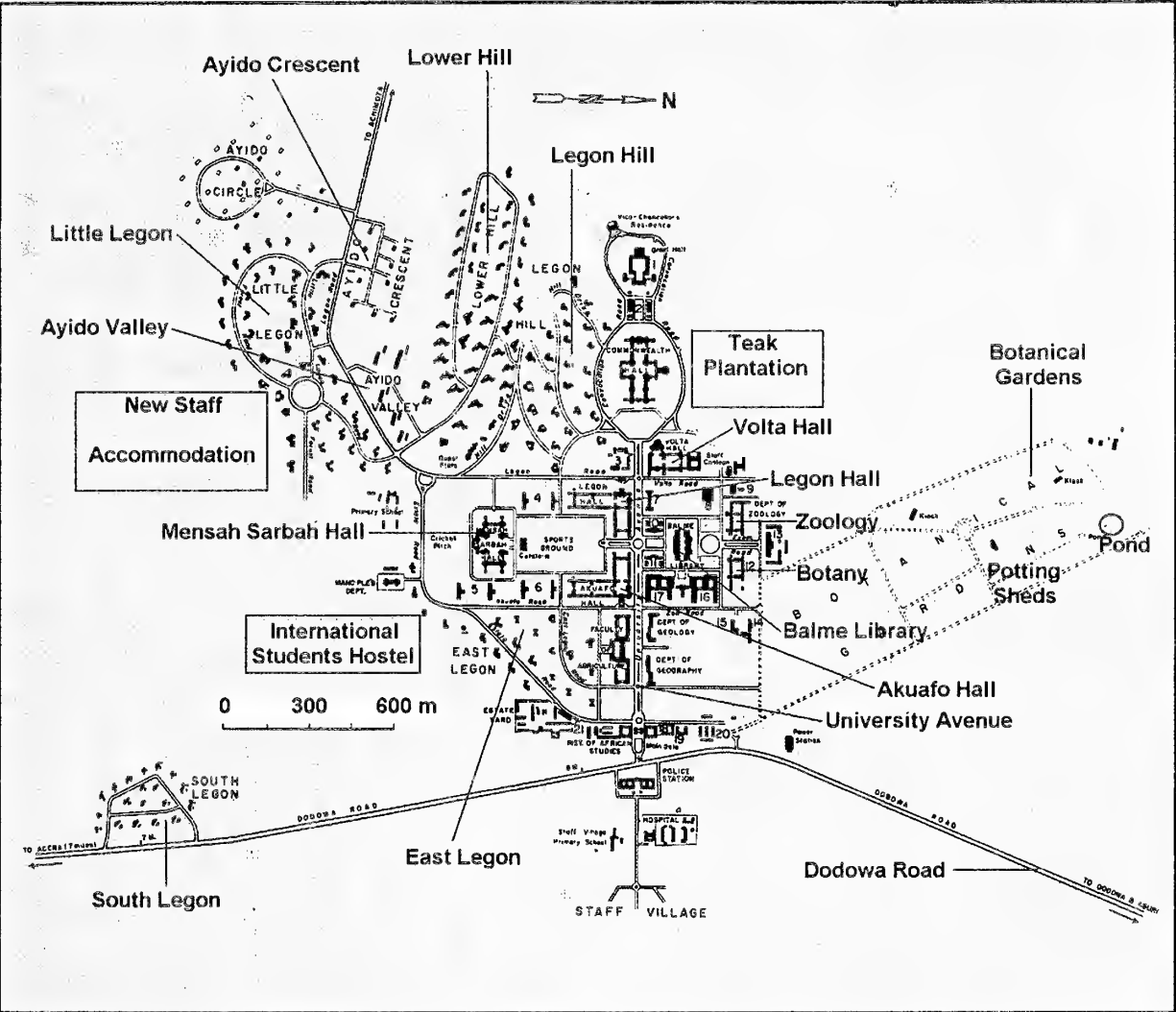


Figure 1. The campus of the University of Ghana in 1993 and the approximate locations of the new staff and students accommodation built since 1993, and the newly planted Teak plantation.

bordering the Botany and Zoology Departments. The majority were more than twice their 1970s height and their canopies were often continuous. Specimens of Rain Tree *Samanea saman* were still flourishing in older residential areas and several Silk Cotton *Ceiba pentandra* trees on Legon Hill were now large enough to house a vulture's nest each. Open parkland, of grass with scattered trees and shrubs, existed between most of the houses, though some areas, e.g. between Ayido Crescent and Ayido Valley and southwest of Little Legon, were overgrown with thicket of mainly Neem *Azadirachta indica* saplings. Houses with gardens had mixed borders of shrubs and trees and those on the periphery of the campus had small plantations of cassava, and clumps of banana and paw-paw trees, much as they did in the 1970s. In the 1970s, Legon Hill had staff residences on the south side and the west and north sides were covered with lush grass, thicket patches and shrub vegetation. By 2004 this vegetation

was degraded through cut and burn farming and that on the north side had been cleared and replaced by a young teak plantation.

Although the infrastructure of the Botanical Garden (Fig.1) had been neglected, the variety of trees and their density were little changed. The Mother of Cocoa *Gliricidia sepium* plantation still existed south of the pond (Fig. 1) but the large Silk Cotton tree that grew near it, and housed a vulture's nest in the 1970s, had fallen. The canopy of the semi-deciduous forest trees planted in the 1950s near the potting sheds was now continuous and the light intensity at ground level was low.

The most important factor that has affected the environment has been the increase in student numbers, particularly in the last decade. Numbers were 2360 in 1971–2, reached 16000 in 2001–2 and then shot up to just over 24800 in 2003–4. Public transport and service vehicles have increased in step with student numbers, and a continuous flow of traffic occurred throughout the day along most roads linking the faculties and student residences (Fig. 1). Short-cut tracks, between lecture rooms and accommodation blocks, criss-crossed the campus everywhere, and grass cover in the central campus was minimal, particularly between Volta Hall, the Balme Library and the Science block. Noise pollution and litter of plastic bags and bottles did not exist in the 1970s but both were now major concerns. In addition, many food stalls contributed to the general pollution.

Results

The 111 indicator species selected, which were recorded in the period late January to late April in the 1960s and 1970s, are listed in Table 1, together with their assessed status for the same months in 2004. Of the 83 present in 2004, seven were more common and 13 less common.

Table 1. Bird species regularly and commonly recorded at Legon from late January to late April in the 1960s and 1970s, and their status in 2004. Status symbols: + more common; = no change; – less common; 0 not recorded.

	Status in 2004
Ardeidae	
<i>Nycticorax nycticorax</i> Black-crowned Night Heron	0
<i>Bubulcus ibis</i> Cattle Egret	+
Accipitridae	
<i>Elanus caeruleus</i> Black-shouldered Kite	–
<i>Milvus migrans</i> Black Kite	+
<i>Necrosyrtes monachus</i> Hooded Vulture	+
<i>Accipiter badius</i> Shikra	=
<i>Kaupifalco monogrammicus</i> Lizard Buzzard	=

Status in 2004

Falconidae
Falco tinnunculus Common Kestrel 0

F. ardosiaceus Grey Kestrel —

F. subbuteo African Hobby =
Phasianidae
Francolinus bicalcaratus Double-spurred Francolin —
Rallidae
Amaurornis flavirostris Black Crake =
Jacaniidae
Actophilornis africana African Jacana =
Charadriidae
Vanellus senegallus Wattled Plover =

V. lugubris Senegal Plover —
Columbidae
Treron calva African Green Pigeon 0

Turtur afer Red-billed Wood Dove =

T. abyssinicus Black-billed Wood Dove =

Streptopelia semitorquata Red-eyed Dove =

S. vinacea Vinaceous Dove 0

S. senegalensis Laughing Dove =
Psittacidae
Poicephalus senegalus Senegal Parrot +
Musophagidae
Tauraco persa Green Turaco —

Musophaga violacea Violet Plantain-eater =

Crinifer piscator Grey Plantain-eater =
Cuculidae
Oxylophus levaillantii Levaillant's Cuckoo =

Cuculus gularis African Cuckoo =

Chrysococcyx klaas Klaas's Cuckoo =

C. caprius Didric Cuckoo =

Centropus senegalensis Senegal Coucal =
Tytonidae
Tyto alba Barn Owl =
Strigidae
Otus scops senegalensis Common Scops Owl =

O. leucotis White-faced Scops Owl —

Glaucidium perlatus Pearl-spotted Owlet =
Caprimulgidae
Caprimulgus climacurus Long-tailed Nightjar =

Macrodipteryx longipennis Standard-winged Nightjar 0

	Status in 2004
Apodidae	
<i>Cypsiurus parvus</i> African Palm Swift	=
<i>Apus affinis</i> Little Swift	=
Alcedinidae	
<i>Halcyon senegalensis</i> Woodland Kingfisher	=
<i>H. chelicuti</i> Striped Kingfisher	0
<i>Ceyx picta</i> African Pygmy Kingfisher	=
Meropidae	
<i>Merops pusillus</i> Little Bee-eater	=
<i>M. albicollis</i> White-throated Bee-eater	=
<i>M. apiaster</i> European Bee-eater	0
<i>M. malimbicus</i> Rosy Bee-eater	0
Coraciidae	
<i>Eurystomus glaucurus</i> Broad-billed Roller	=
Phoeniculidae	
<i>Phoeniculus purpureus</i> Red-billed Wood-Hoopoe	=
Bucerotidae	
<i>Tockus fasciatus</i> African Pied Hornbill	=
<i>T. nasutus</i> African Grey Hornbill	=
Capitonidae	
<i>Pogoniulus chrysoconus</i> Yellow-fronted Tinkerbird	=
<i>Lybius vieilloti</i> Vieillot's Barbet	—
<i>L. bidentatus</i> Tooth-billed Barbet	=
Picidae	
<i>Campethera punctuligera</i> Fine-spotted Woodpecker	=
<i>Dendropicos goertae</i> Grey Woodpecker	=
Alaudidae	
<i>Mirafra rufocinnamomea</i> Flappet Lark	0
Hirundinidae	
<i>Hirundo senegalensis</i> Mosque Swallow	—
Motacillidae	
<i>Motacilla flava flava</i> Blue-headed Wagtail	0
<i>M. f. thunbergi</i> Grey-headed Wagtail	0
<i>Anthus leucophrys</i> Plain-backed Pipit	0
<i>A. trivialis</i> Tree Pipit	0
<i>Macronyx croceus</i> Yellow-throated Longclaw	0
Campephagidae	
<i>Campephaga phoenicea</i> Red-shouldered Cuckoo-Shrike	=
Pycnonotidae	
<i>Andropadus virens</i> Little Greenbul	0
<i>Chlorocichla simplex</i> Simple Greenbul	=

	Status in 2004
<i>Pycnonotus barbatus</i> Common Bulbul	=
Turdidae	
<i>Luscinia megarhynchos</i> Nightingale	0
<i>Cossypha niveicapilla</i> Snowy-crowned Robin-Chat	=
<i>Turdus pelios</i> African Thrush	=
Sylviidae	
<i>Melocichla mentalis</i> Moustached Grass-Warbler	0
<i>Hippolais polyglotta</i> Melodious Warbler	=
<i>Cisticola erythrops</i> Red-faced Cisticola	—
<i>C. cantans</i> Singing Cisticola	0
<i>C. natalensis</i> Croaking Cisticola	0
<i>C. brachypterus</i> Siffling Cisticola	0
<i>C. juncidis</i> Fan-tailed Cisticola	0
<i>Prinia subflava</i> Tawny-flanked Prinia	=
<i>Heliolais erythroptera</i> Red-winged Warbler	=
<i>Camaroptera brachyura</i> Bleating Warbler	=
<i>Eremomela pusilla</i> Senegal Eremomela	=
<i>Phylloscopus trochilus</i> Willow Warbler	=
<i>P. sibilatrix</i> Wood Warbler	=
Muscicapidae	
<i>Muscicapa striata</i> Spotted Flycatcher	—
Timaliidae	
<i>Turdoides plebejus</i> Brown Babbler	=
<i>T. reinwardtii</i> Blackcap Babbler	=
Nectariniidae	
<i>Cyanomitra verticalis</i> Green-headed Sunbird	=
<i>Cinnyris chloropygia</i> Olive-bellied Sunbird	0
<i>C. coccinigastra</i> Splendid Sunbird	=
<i>C. cuprea</i> Copper Sunbird	=
Zosteropidae	
<i>Zosterops senegalensis</i> Yellow White-eye	0
Laniidae	
<i>Corvinella corvina</i> Yellow-billed Shrike	+
Malaconotidae	
<i>Malaconotus blanchoti</i> Grey-headed Bush-Shrike	=
<i>M. sulfureopectus</i> Orange-breasted Bush-Shrike	=
<i>Tchagra senegala</i> Black-crowned Tchagra	=
<i>Dryoscopus gambensis</i> Northern Puffback	=
<i>Laniarius aethiopicus</i> Tropical Boubou	—
<i>L. barbarus</i> Yellow-crowned Goney	—
<i>Nilaus afer</i> Brubru	0

	Status in 2004
Prionopidae	
<i>Prionops plumatus</i> White Helmet-Shrike	0
Dicruridae	
<i>Dicrurus adsimilis</i> Fork-tailed Drongo	=
Corvidae	
<i>Corvus alba</i> Pied Crow	+
Sturnidae	
<i>Lamprotornis purpureus</i> Purple Glossy Starling	=
<i>L. chloropterus</i> Lesser Blue-eared Starling	0
<i>Cinnyricinclus leucogaster</i> Amethyst Starling	=
Passeridae	
<i>Passer griseus</i> Northern Grey-headed Sparrow	+
Ploceidae	
<i>Ploceus nigricollis</i> Black-necked Weaver	=
<i>P. heuglini</i> Heuglin's Masked Weaver	=
<i>P. cucullatus</i> Village Weaver	=
<i>Euplectes macroura</i> Yellow-mantled Widowbird	0
Estrildidae	
<i>Lagonosticta rufopicta</i> Bar-breasted Firefinch	—
<i>Spermestes cucullatus</i> Bronze Mannikin	=
Viduidae	
<i>Vidua macroura</i> Pin-tailed Whydah	0
<i>V. wilsoni</i> Bar-breasted Firefinch Indigobird	0

Birds more common in 2004

In the following, the first sentence gives status in the 1960s and 70s; second sentence 2004.

Cattle Egret. Visited campus each day but did not roost there. A roost of at least 300 in trees overhanging the pond in the Botanical Gardens and many in breeding dress in late April.

Black Kite. Roosted in small numbers in the Botanical Gardens and a pair nested near the University Guest Centre. At least 30 roosted regularly within the gardens and two pairs bred, one on Legon Hill and the other at the site used in the 1970s.

Hooded Vulture. A pair nested annually in a Silk Cotton tree near the pool in the Botanical Gardens. Twelve nests with young were located on the campus, three clustered around Commonwealth Hall, three in trees along the University Avenue, two in Little Legon and the rest on Legon Hill; up to 50 birds rested during mid-day on a watered playing field near Mensah Sarbah Hall and many roosted on the campus.

Senegal Parrot. Infrequent in the mid-1960s but their numbers increased in the 1970s as trees increased in size and their foliage became more profuse. This was even

more apparent in 2004, when noisy flocks were daily present in the Botanical Gardens and in all of the residential areas; pairs were investigating nest holes.

Yellow-billed Shrike. Twenty-three groups (*c.* 276 birds) present in Mar 1973 (Grimes 1980). Thirty-three groups (*c.* 297 shrikes) there in Mar 2004 (Grimes 2006). Pied Crow. Regular visitor to Legon and nested there but nearest roost was at Achimota, some 8 km to the west. Large roosts present in trees along University Avenue and within Legon and Akuafo halls: in a 10-min. period at dusk on 27 Feb 2004, 66 birds moved into the Legon Hall roost from the west; several pairs beginning to build nests, early April.

Northern Grey-headed Sparrow. Present and some pairs nested. Pairs were breeding in all the halls of residence and in roofs of staff houses.

Birds less common in 2004

As in the previous section, the first sentence gives status in the 1960s and 70s; second sentence 2004.

Black-shouldered Kite. Regularly sighted, usually above Legon Hill and within the Botanical Gardens, including a nest with two eggs, 5 Feb 1974, in a tree which also contained a Yellow-billed Shrike's nest. Only record one bird near southern edge of campus, 3 Mar.

Grey Kestrel. Nested in 1970s and regularly sighted on campus. Single birds only seen, 20 Feb and 13 Mar.

Double-spurred Francolin. Frequent in cassava farms bordering campus and in thickets in Botanical Gardens. Only occasional in farms bordering Little Legon.

Senegal Plover. Frequently visited playing fields at night, usually in noisy groups of 4–6. Only once heard near Legon Hall, 7 Mar.

White-faced Owl. Regularly recorded and bred annually, Oct–Feb. Only one, 7 Apr.

Green Turaco. Usually seen, singly or in pairs, on each visit to the Botanical Gardens. Only once recorded there, 16 Apr.

Vieillot's Barbet. Duetting pairs were a feature of the acoustical landscape and bred in the residential areas. Only heard duetting 18 Apr.

Mosque Swallow. Often recorded hawking over Legon. Few sightings.

Red-faced Cisticola. Duets a feature of the acoustical landscape in areas with rank grass and thickets. Only recorded in Little Legon on four occasions.

Spotted Flycatcher. Regular visitor to well established gardens in Little Legon. Only twice recorded.

Tropical Boubou. Bell-like calls a feature of the thicket areas of the Botanical Gardens and on Legon Hill. Only heard 23 Apr.

Gonolek. Occurred in all thicket patches within the Botanical Gardens and in the residential areas and heard regularly. Only two pairs regularly heard in Little Legon.

Bar-breasted Fire-Finch. Frequent in small groups in mature gardens, often visiting garden pools. Only recorded Little Legon, 8 Mar.

Birds not recorded in 2004

Because the 28 species not recorded were readily identifiable in the field, either through sight or sound or both, I am confident that they would have been detected if they had been present. Of these species, the following illustrate typical data collected in the 1960s and 1970s. Black-crowned Night Heron occurred regularly in the Botanical Gardens and roosted near the pond. African Green Pigeon was resident and found within the residential areas and the Botanical Gardens. Standard-winged Nightjars were regularly spotted at night on roads around Legon Hill. Striped Kingfishers frequented playing fields and were particularly vocal mid-Feb to mid-Mar. The European Bee-eater was infrequently recorded in the early 1960s but flocks of ≥ 20 birds were present in the 1970s, either feeding within cassava plots or hawking over the campus, and flocks (≥ 10 birds) of Rosy Bee-eaters were regularly recorded hawking over the campus in the early morning in the 1970s. In the 1960s, Little Greenbuls, Nightingales and Olive-bellied Sunbirds were regularly heard singing or calling from within an extensive area of thicket in the Botanical Gardens. Initially this was protected because of its unique structure, density and composition but by the mid-1970s much of this had been removed and all three species suffered, the Little Greenbul and Olive-bellied Sunbirds being extirpated before the Nightingale. The Yellow Wagtail was a regular visitor and foraged on landscaped grassed areas of the campus and on playing fields, late Sep to end of Mar or early Apr; my only record in 2004 was at Sakumo lagoon, some 30 km east of Legon, 18 Apr. Both Plain-backed and Tree Pipits occurred on playing fields and open parkland, the latter often with wagtails. Family groups of White Helmet-Shrikes often passed through the residential areas of Little Legon and Legon Hill in the late 1960s and 70s, suggesting that some groups were probably resident elsewhere on the plains. The distinctive songs, song flights or calls of the Vinaceous Dove, Flappet Lark, Yellow-throated Longclaw, Moustached Grass-Warbler, the four cisticolas, Yellow White-eye, Brubru, Yellow-mantled Widowbird and Pin-tailed Whydah were a feature of the acoustical landscape in the 1960s and 70s, and males of the last two species were in breeding dress in late Mar or early Apr. The only male pin-tails located in Mar and Apr 2004 were in the Aburi Botanical gardens, some 30 km north of Legon.

Species not recorded on the campus in the 1960s and 1970s but present in 2004

Of the species not present at Legon in the 1960s and 1970s, two had been recorded elsewhere on the Accra plains in the 1970s: Rose-ringed Parakeet *Psittacula krameri* in the Shai Hills c. 50 km east of Legon and Blue-breasted Kingfisher *Halcyon malimbica* at Achimota c. 8 km to the west (not at Legon as stated in Grimes 1978). The Red-fronted Parrot *Poicephalus gulielmi*, a rain forest species, sighted in a flock of Senegal Parrots (13 Feb 2004) was probably an escapee as it is often kept as a captive bird in Accra (R.J. Dowsett *in litt.*).

Both the Splendid and Long-tailed Glossy Starlings were established species at Legon in 2004 and one at least was breeding. The Splendid, a mainly lowland forest species, was the most abundant and noisiest glossy starling on the campus, even at 3h00,

and the most pugnacious. It competed for nesting sites with Long-tailed in trees near Commonwealth Hall chapel and with Purple Glossy Starling elsewhere on the campus. One pair was feeding young in a nest hole in a tree near the University Guest Centre in February and early April. Its arrival time in the Accra area is not known, though flocks were twice recorded at Legon in 1988 (Dutson & Branscombe 1990, see also Allan 1996). In the 1970s, Long-tailed inhabited the drier areas north of the forest belt. In 2004, a group of three was always present in trees just south of Commonwealth Chapel and in nearby areas of Legon Hill, one was twice recorded in the Botanical Gardens (2 Feb, 6 Mar), and an adult was seen carrying a leaf on several occasions in Feb. It is not known when Long-tailed Glossy Starling reached the Accra Plains but small numbers were recorded in Accra, though not at Legon, as early as 1988 (Dutson & Branscombe 1990). It may well have arrived on the Plains through the drier Volta Region corridor.

Discussion

The reduction in size of thicket, grass savanna and playing fields, and the general degradation of the vegetation surrounding the Legon campus can adequately account for the absence of most of the 28 species that were not seen in 2004 and the reduction in numbers of 13 others. In addition, the general disturbance and noise due to the 10-fold increase in student numbers would also make the campus unattractive to many species. At the same time, the easy availability of food from the numerous food stalls and undisposed waste on the campus would account for the increase in numbers of the Black Kite, Hooded Vulture, Pied Crow and Grey-headed Sparrow. The likely causes for the change in status of other species are more difficult to identify and would require longer observation. The species list will permit assessment of future changes in the avifauna at Legon due to environmental changes. These will undoubtedly occur as a further increase in student numbers is planned. I was pleasantly surprised to find the campus much as I remembered it and it was a delight to walk in familiar territory and hear familiar and new sounds. It remained a haven of rest for visitors from bustling Accra despite the explosion in student numbers, and may it long continue so.

Acknowledgments

Dr Frank Walsh read an earlier draft of this paper but the format has been much improved through the comments of referees. To all, especially the latter, I am indebted.

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Social interactions, moult and pre-migratory fattening among Yellow Wagtails *Motacilla flava* in the Nigerian Sahel

by Christopher Paul Bell

Conservation Programmes, Zoological Society of London,
Regent's Park, London NW1 4RY, U.K. <chris.bell@zsl.org>

Received 10 January 2006; revised 20 March 2006.

Summary

Yellow Wagtails were studied at Nguru, northern Nigeria, just before pre-nuptial migration, and the findings are compared with results of similar studies carried out elsewhere in the country. Wagtails foraged mainly on farmland, as recently observed elsewhere in Nigeria, but in contrast to 30 years earlier when they fed mostly around cattle and at water margins. Males defended compact territories in which females appeared to feed opportunistically, contributing to a high level of aggression and indicating a densely packed population. Subspecies, age and sex composition were consistent with previous studies in northern Nigeria. When compared with more southerly wintering populations, the preponderance of males and adults, and a diverse range of subspecies characteristic of breeding areas in southern Europe, indicate marked differential and leap-frog migration patterns. Pre-migratory fattening was detected only in adult males, in contrast to previous studies in the same area showing fattening across all population classes over the same calendar period. Together with low weights among non-fattening birds, lack of overlap between fattening and moult, and a high density and level of agonistic behaviour, this suggests a population under stress, consistent with recent catastrophic loss of available habitat in the local area.

Résumé

Intéractions sociales, mue et engraissement pré-migratoires chez la Bergeronnette printanière *Motacilla flava* au Sahel nigérian. Les Bergeronnettes printanières ont été étudiées à Nguru, nord du Nigéria, juste avant la migration prénuptiale, et les résultats sont comparés à ceux d'études similaires menées ailleurs dans le pays. Les bergeronnettes se nourrissaient surtout dans les champs, comme on l'a récemment observé ailleurs au Nigéria, mais non plus comme 30 ans plus tôt surtout près du bétail et au bord de l'eau. Les mâles défendaient de petits territoires où les femelles semblaient se nourrir de façon opportuniste, ce qui contribuait à un haut niveau

d'agressivité et indiquait une forte densité de population. La répartition en sous-espèces, âges et sexes correspondait à celle des études précédentes dans le nord nigérian. La comparaison de cette population à celles hivernant plus au sud, la prépondérance des mâles et des adultes ainsi qu'une distribution des sous-espèces caractéristiques des zones de reproduction au sud de l'Europe, indiquaient un système de migration différentiel prononcé et en saute-mouton. L'engraissement pré-migratoire n'a été mis en évidence que chez les mâles adultes, contrairement à des études antérieures dans la même région qui montraient l'engraissement pour toutes les classes de population durant la même période. Aussi bien les poids faibles parmi les sujets n'ayant pas engraisé que l'absence de chevauchement entre engraissement et mue de même qu'une forte densité et le niveau élevé d'agressivité, révèlent une population sous tension, ce que confirme la récente et catastrophique perte d'habitat disponible dans la région locale.

Introduction

For migratory birds, and particularly long-distance migrants, the period immediately prior to pre-nuptial migration is critical. Preparation and departure must be timed to enable arrival on the breeding grounds at the optimal time to maximise breeding success (Møller 1994). Insectivorous Palaearctic migrants wintering just south of the Sahara need to build up a large fat depot to enable crossing of the desert, at a time when many wintering areas have experienced no rain for up to half a year, and arthropod availability is at an annual low. Many such migrants also undergo substantial moults in late winter, creating an additional energetic requirement that may conflict with the need to acquire an energy surplus to lay down fat reserves.

The Yellow Wagtail *Motacilla flava* is an insectivorous Palaearctic migrant that has been relatively well studied in its sub-Saharan wintering area, mainly due to the relative ease of trapping large numbers at mass roosts (Smith & Ebbutt 1966, Fry *et al.* 1972, Wood 1978). The species has marked leap-frog and differential migration patterns, the latter partly mediated by a gradual southerly shift in population over the course of the winter that varies in degree among population age and sex classes. It has also been shown to depart the wintering ground in sequence according to breeding latitude, with more southerly breeding (and northerly wintering) populations migrating earlier (Wood 1975, 1992).

In order to understand how the species manages its energy in the period prior to migration, I studied pre-migratory fattening, moult, and social organisation in a population of Yellow Wagtails in the Sahel of N Nigeria, where energy trade-offs may be particularly acute. I compare results with previous studies carried out in the same area and elsewhere in Nigeria, in the context of short- and long-term changes in the environment, and ideas about the origin of migration patterns.

Methods

Fieldwork was carried out between 12 and 31 Mar 2005 at Nguru (12°52'N, 10°27'E) in N Nigeria. Nguru is situated at the N edge of the floodplain of the Hadejia and Jama'are rivers, where the annual flood supports a dry season "recession farming" economy, in which plots are cultivated by hand in the wake of receding flood waters (Hollis *et al.* 1993). Primary crops are cowpea, groundnuts, okra and onions, and such farmland forms the principal foraging habitat of wagtails wintering in the area. The study area comprised a c. 50 ha strip of farmed land, sandwiched between dry, uncultivated savanna to the north and flooded areas to the south supporting extensive stands of *Typha australis*.

Mist netting was carried out daily using two 12-m, four-panel nets in cultivated plots either side of the main Nguru–Hadejia highway, between 3 and 5 km west of Nguru. Mist-netting rapidly became confined to the 2–3 h following sunrise, and 1–2 h before sunset, owing to a persistent NE wind that prevailed in the middle of the day. Individual netting sessions were rotated around six sites scattered across the cultivated area, to minimize habituation to, and avoidance of, the nets by foraging wagtails. Each captured wagtail was ringed, weighed using a spring balance, and aged and sexed where possible using standard criteria (Alström & Mild 2003). Diagnostic subspecific characters were recorded, and each bird was also examined for moult.

Mist-netting operations afforded ample opportunity to observe social interactions and territoriality among the focal populations. The variable plumage of the wagtails in the area meant that individuals became quickly recognisable, enabling mapping of some of the territories near the nets. This proved possible at the five out of six sites where netting was carried out on at least five days.

Weights were obtained at varying times of day, so for analyses Nguru weights are corrected to sunset (18h30) assuming a linear weight gain of 1.2g during the hours of daylight (this applies to the analyses presented in Figs 1 and 2 and Tables 2 and 3).

Results

Subspecies, sex, and age

The 81 wagtails captured and examined varied greatly in subspecific characteristics, as determined primarily by colour and head markings (Table 1). Most males were assignable either to *M. f. flava* or *M. f. cinereocapilla* (Fig. 1), while a few resembled the plumage variants *M. f. "dombrowskii"*, with a relatively dark blue crown and blue-black ear coverts, or *M. f. "superciliaris"*, with an entirely blue-black crown, both with a white supercilium (Fig. 2; Alström & Mild 2003). The majority of females resembled typical *M. f. flava*, but some resembled females of the dark-headed populations of the Mediterranean basin, either lacking a pale supercilium or with a relatively dark crown (Alström & Mild 2003), and in many cases showing both of

these characteristics. Females were assigned to subspecies as follows: pale head and well-defined supercilium = *M. f. flava*; dark head and ill-defined supercilium = *cinereocapilla*; any other = "intermediate" (considered equivalent to "*dombrowskii*" or "*superciliaris*" among males). Two birds had entirely green crowns and bright yellow supercilia and underparts (Fig. 3), and were assigned as females as both had shorter wings than any of the males examined.

The sex ratio in the mist-net sample showed a slight preponderance of males, and of the birds that it was possible to age accurately, only one in five proved to be a first winter bird (Table 1).

Table 1. Trapped wagtail age, sex and "subspecies" categories.

	green-headed	<i>flava</i>	" <i>dombrowskii</i> "	" <i>superciliaris</i> "	<i>cinereocapilla</i>	Total
Adult ♂		13	2	3	10	28
1st-winter ♂		3		2	3	8
Unknown ♂		4	2		2	8
		intermediate				
Adult ♀	2	15		4	3	24
1st-winter ♀				3	2	5
Unknown ♀		5		1	2	8
Total	2	40		17	22	81

Weight

Four birds were retrapped on a later date (Fig. 4), and the two that were still moulting when retrapped, both of which were territory-holding males, had lost weight. One of these birds was also retrapped twice on the date of first capture, showing a marked



Figure 1. Male *M. f. flava* (left) and *M. f. cinereocapilla*.



Figure 2. Male *M. f. "dombrowskii"* (left) and *M. f. "superciliaris"*.

decrease in weight over the course of a few hours (Fig. 4). Since short-term weight loss may have been an effect of the capture itself, retraps are excluded from subsequent analyses of weight. No weight increase over time was detectable among



Figure 3. Female with green crown and yellow supercilium.

females (mean weight 15.3 g) or first-winter males (mean 16.7 g), but adult males increased steadily in weight at a mean rate of 0.25g per day (Fig. 4, Table 2). This compares with a rate of 0.43g per day in a population sampled using a similar

protocol on farmland near Jos in central Nigeria (9°49'N, 8°54'E) in early April 2004 (Bell in press), corresponding to a prediction that southerly wintering populations should fatten more quickly (see Discussion). The difference between the two studies approaches significance ($ss = 8.867$, $F_{1,120} = 2.195$, $P = 0.07$ one-tailed, 95% confidence interval for the difference of -0.058 to 0.406), despite the high error variance for slope inherent in data sets of this kind (Bell in press).

The trends in weight at Nguru contrast sharply with those indicated by a study carried out within 1° of latitude of Nguru at Kano (12°0'N, 8°30'E), where a marked increase in weight was noted among both males and females over the same calendar period in two successive years (Wood 1976, 1992). Trends differ significantly between the two datasets for both males and females (Table 3). Nguru adult males, though increasing in weight, did so around 6–8 days later than males in the earlier sample (Fig. 4). Nguru females were also significantly lighter than females sampled at Kano prior to the start of pre-migratory fattening in early March (Fig. 5).

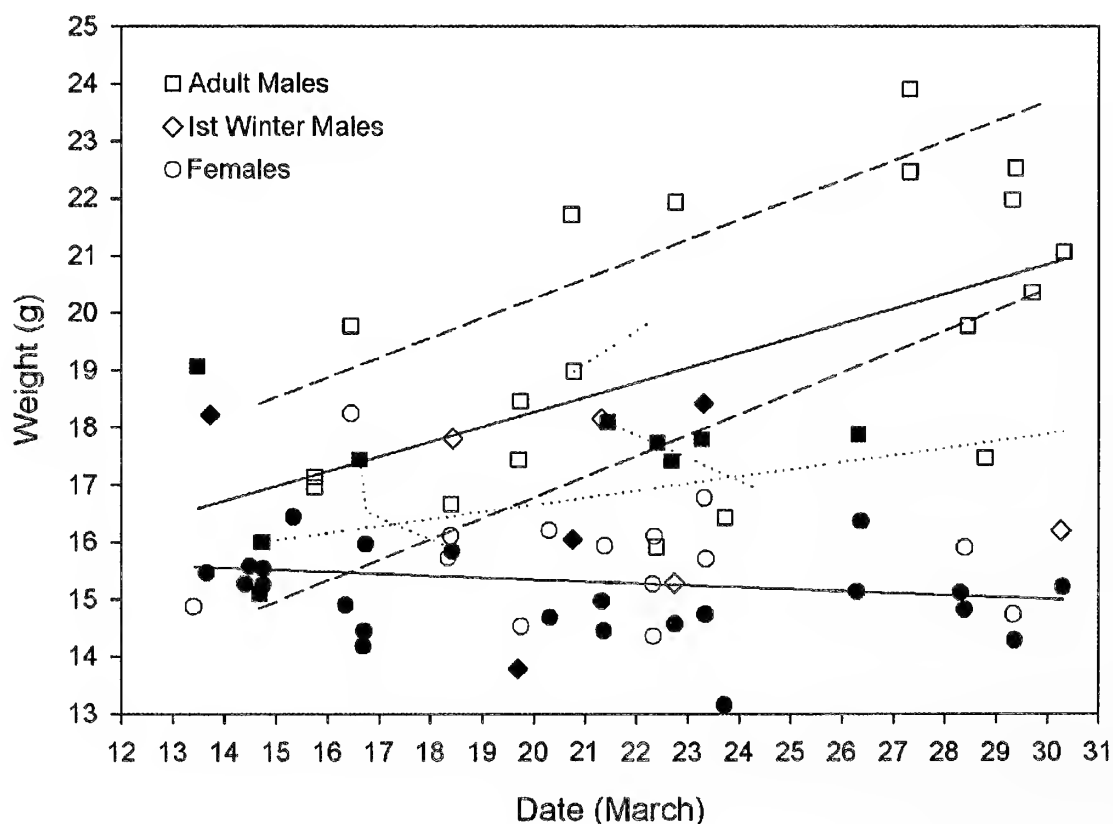


Figure 4. Weights of Yellow Wagtails at Nguru, 2005. Solid symbols indicate moulting birds. Solid regression lines: adult males (upper) and females (lower). Dashed lines: regressions for males and females in a 1974 sample from Kano (Wood 1976). Dotted lines: weight changes in re-trapped birds.

Table 2. Analysis of covariance of weights of Yellow Wagtails at Nguru, March 2005. Model simplification proceeds with removal of non-significant levels of the interaction between sex-age category and date, followed by removal of the age factor within females only, to give the minimum adequate model.

	<i>df</i>	<i>ss</i>	<i>ms</i>	<i>F</i>	<i>P</i>
Residual	57	131.83	2.313		
Date x Adult ♀	1	1.755		0.759	0.387
Date x Adult ♂	1	50.09		21.66	<0.0001
Date x first-winter ♀	1	0.3984		0.172	0.680
Date x first-winter ♂	1	0.8487		0.367	0.547
Residual	60	134.83	2.247		
Adult ♀ x first-winter ♀	1	2.427		1.080	0.303
Residual	61	137.26	2.250		
♀ x first-winter ♂	1	12.72		5.653	0.021

Table 3. Analysis of covariance comparing weights of Yellow Wagtails at Nguru with those at Kano, March 1974.

		<i>df</i>	<i>ss</i>	<i>ms</i>	<i>F</i>	<i>P</i>
♂♂	Residual	82	430.77	5.253		
	Date x Site	1	4.050		0.771	0.383
	Residual	83	434.82	5.239		
	Site	1	92.85		17.723	<0.0001
	Date	1	226.6		43.253	<0.0001
♀♀	Residual	63	145.16	2.304		
	Date x Site	1	72.77		31.584	<0.0001

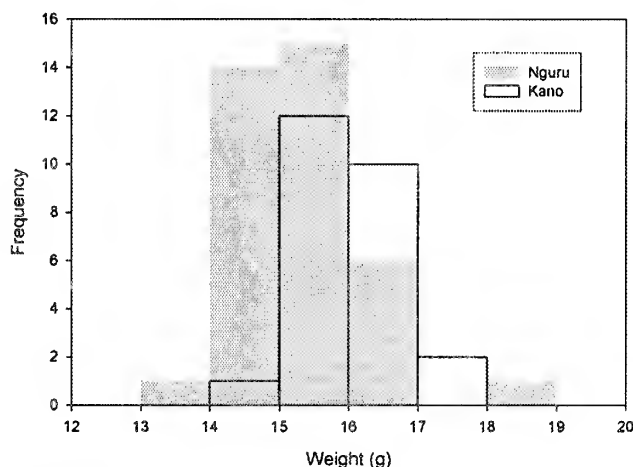


Figure 5. Weights of female Yellow Wagtails at Nguru in March 2005, compared to Kano, early March 1974 (data from Wood 1992). Mean weight for Kano birds is significantly greater ($ss = 3.68$, $F_{1,60} = 4.86$, $P = 0.03$).

Moult

Moulting birds were found throughout the study, though the proportion showing evidence of moult declined (Fig. 6 and Table 4). Females may have lagged behind males in the progress of moult, as previously noted in Nigeria (Wood 1976). Most females were still moulting at the end of the study, but no moulting males were seen after 26 March (Fig. 6). Moult was complete in all of the heavy males seen during the latter part of the study period (Fig. 4), suggesting that pre-migratory fattening began in earnest only when moult had ended.

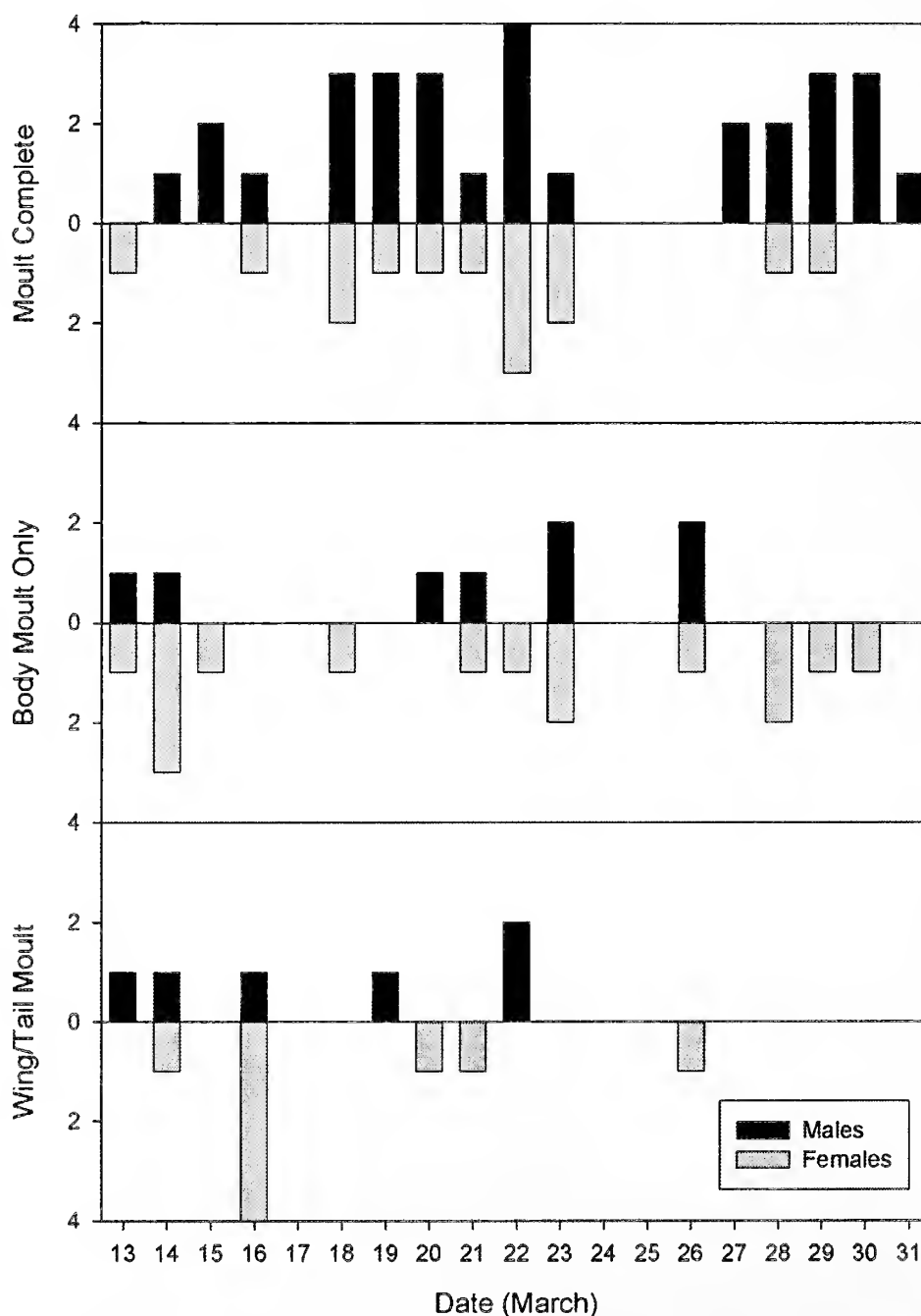


Figure 6. Numbers of wagtails in three consecutive stages of moult.

Table 4. Analysis of covariance of moult stage among Yellow Wagtails at Nguru, where birds showing wing and/or tail moult = 0, body moult only = 1, completed moult = 2. A binomial error structure and logit link function were used with scaled deviance to adjust for overdispersion of the data.

	df	scaled deviance	ms	F	P
Residual	78	96.46	1.279		
Date	1	6.10		4.77	0.032
Sex	1	4.32		3.38	0.070

Social Organisation

The area around at least five of the six mist-netting locations was divided up into territories, held almost exclusively by males and defended vigorously against intruding wagtails. Defended areas were small, typically no more than around 30 m in diameter. Some females also occupied consistent foraging areas, and some agonistic interactions between females were seen. However, only two females were seen to defend territories against intruding males. Most females appeared non-territorial, fed opportunistically in male territories, but retreated on the approach of the territory owner. Of the trapped birds, 11 were identified as territory holders, all of which were males. Nine of these were aged, and all except one were second-winter or older.

Two male wagtails appeared to abandon territories after being trapped, and on both occasions the vacant territory was immediately occupied and defended by another wagtail, in one case a female. The replacement male was subsequently trapped and was found to be older than one year, perhaps suggesting the presence of mature males among the non-territorial population.

Discussion

Social behaviour in relation to the environment

The territorial behaviour seen at Nguru is in sharp contrast to the situation on similar habitat at Jos in April 2004, where wagtails formed roving flocks of up to 200 birds (Bell in press) and showed no evidence of territorial behaviour. This difference almost certainly relates to differences in the agricultural regime. At Jos, fields of tomatoes and peppers relied on periodic irrigation with water pumped from nearby borrow pits. This was done in rotation, with different embanked enclosures irrigated in turn over a period of days, and wagtail flocks would generally alight in areas that had been recently irrigated. Flocking behaviour may therefore reflect the fact that food availability is always highest in the area most recently irrigated. By contrast at Nguru, the crops rely on a more stable high water table, and defence of territories is appropriate for dominant males at least.

Territories at Nguru were considerably smaller than areas used by breeding wagtails in Europe: generally several hectares when young are in the nest (Bell 1995).

The tightly packed territories of *c.* 0.1 ha also indicate a much higher density of wagtails than at Jos, where about 75 ha of farmland held around 300 wagtails (Bell 2006). A similar area at Nguru might hold up to 750 territories, and if the trap sample reflects overall sex ratio in the population, the density including non-territorial birds might be double this, especially if, as seems likely, there were many first-year and some adult males in the floating population. Competition to re-establish temporarily undefended territories might have contributed to the weight loss of two retrapped territory holders, since both frequented an area with particularly high densities and high frequency of agonistic interactions.

The concentration of wagtails in areas of cultivation at both Nguru and Jos contrasts with the situation observed in both areas in the 1970s, when the primary habit of wagtails on the Jos plateau was foraging around herds of cattle, while further north they were confined to water margins (Wood 1976). Very little evidence for association with cattle was seen in 2004–5, though cattle herds were searched for wagtails during initial prospecting at both at Jos and Nguru, and itinerant cattle herds regularly passed by study areas at both sites. At Jos, flocks of wagtails were occasionally seen to break off from foraging among crops to feed around a passing herd of cattle, but this was never seen to happen at Nguru.

This apparently widespread switch in behaviour may be related to the marked increase in the area under cultivation in Nigeria over the same period (Wint & Bourn 1994), particularly dry season cultivation (contrasting with a recent local decrease in this habitat at Hadejia-Nguru: Anon 2005, see below). The likely continuation of this trend might be beneficial for Yellow Wagtails, since dry season farming appears to create extremely valuable wintering habitat for the species. Interestingly, the change in wintering habitat parallels a switch in breeding habitat in Europe from pasture to arable land (Wilson & Vickery 2005).

Migration Patterns

The variable head colour of wagtails at Nguru gives clues to the breeding range of the population. Ringing recoveries indicate that wagtails wintering in Nigeria breed along a corridor from the central Mediterranean to the Baltic, and this corresponds to the variety of subspecies found in Nigeria in winter, mainly *M. f. flava*, but also *M. f. thunbergi*, *cinereocapilla* and *feldegg* (Wood 1982), the latter two occurring only in the north of the country, and *thunbergi* only in the south outside migration periods.

In this study only *M. f. cinereocapilla* and *M. f. flava* were identified with certainty. The former clearly breed in Italy or nearby, while the latter could potentially originate in a wide area from Hungary and Romania north to S Finland and NW Russia. However, given the general leap-frog pattern indicated by subspecies distribution and ringing recoveries, the southern portion of this zone is perhaps most likely.

No birds belonging to *M. f. feldegg* were found, but several corresponded to either “*dombrowskii*” or “*superciliaris*”, two types conventionally considered intermediate between *M. f. flava* and *feldegg*, whose breeding origin is generally assigned to a zone

of overlap between these two subspecies. Alström and Mild (2003) define this zone as extending from the Dalmatian coast of the Adriatic and its immediate hinterland, through N Albania and Macedonia to Bulgaria, and around the N coast of the Black Sea to the N Caucasus. The most likely breeding area for these birds, therefore, is the westernmost portion of this zone, stretching from Slovenia to Macedonia and W Bulgaria, where it overlaps with the zone of recovery for Nigerian-ringed birds.

The two green-headed individuals corresponded rather closely to *M. f. flavissima* or *M. f. lutea*, which breed in the British Isles and the lower Volga region, respectively. However both of these regions are well outside the zone of origin defined by ringing recoveries, and since green-headed birds are known from central European breeding populations (Alström & Mild 2003) it seems likely that these birds originated there.

The sex and age composition of the Nguru sample compared to wintering populations observed elsewhere in Nigeria is consistent with differential migration. The slightly male-biased sex ratio in the Nguru sample (54% male) is similar to that in the Kano study, where 62% ($n = 207$) and 60% ($n = 236$) males were obtained over the period Feb–Apr 1974–5 (Wood 1976). This contrasts with the sample obtained at Jos in April 2004 in which only 35% ($n = 95$) were male, which is consistent with an earlier study in the Jos area that showed the proportion of males declining from about 50% in mid winter to around 40% in mid-March (Wood 1976). The same study showed no temporal trend in the proportion of first year birds, which comprised 36% of the sample ($n = 996$), compared with 20% at Nguru. These data all tend to indicate a differential migration pattern in which adult males predominate in the populations wintering closest to the breeding grounds, with greater proportions of first-years and females in more distant wintering areas, as well as a greater tendency for females to move south over the course of the winter.

Comparison of the rate of increase in mean weight between Nguru and Jos is relevant to the hypothesis that differential and leap-frog patterns reflect variation in optimal latitude for fattening in relation to the timing of spring migration (Bell 1996, 2005, in press). Increase in mean weight in the Jos population was higher than among adult males at Nguru, corresponding to a prediction that southerly wintering populations fattening in the wake of drought-breaking rains should do so more quickly than those wintering in the north, which migrate before the end of the dry season. Any inference about the utility of the theory is weak, however, since conditions at Nguru in 2005 were far from typical, as discussed below. Moreover, the competing energetic demands of moult may have helped to reduce the rate at which the sampled cohort gained weight compared to the Jos birds, which fatten later in the year when moult is complete.

Timing of pre-migratory fattening

The lack of weight gain among females and the relatively late timing of weight gain among males, compared to a population sampled at Kano some 30 years earlier,

confounds expectations arising from the tendency towards earlier spring migration among migrants breeding in Europe over the same period (Lehikonen *et al.* 2003). The Kano study indicates that male wagtails reached departure weight around the end of March, and females about a week later, which corresponds well with the usual arrival time and timing of the breeding season in the southern European breeding sites of locally wintering populations (Spina *et al.* 1994). In the population studied at Nguru, only the heaviest males would have been able to migrate at the end of March, and if the trend among adult males continued most would not be able to depart until well into April, while departure by females would be impossible until late in the month. Such late arrival on the breeding grounds would be likely to profoundly depress breeding success, unless optimal arrival time has become later over recent years, which seems unlikely.

One possible cause of the apparent delay in pre-migratory fattening is energetic constraint, and several other lines of evidence suggest this may have been significant. Although moult and fattening periods overlap, there is little evidence for overlap at an individual level, suggesting that it may have been difficult to moult and fatten at the same time under the prevailing circumstances. That this is not always the case is shown by the frequency with which wagtails arrive on spring passage in Europe while moult is still in progress (Serra *et al.* 1992). Additionally, the occurrence of many birds at low weights in the population suggests that low-status birds, in particular females, were finding it difficult to maintain body condition.

The evidence converges on the conclusion that conditions encountered by the population at Nguru in 2005 were significantly worse than those enjoyed by populations studied previously at Kano and elsewhere through the period of pre-nuptial migration. One possibility is that low rainfall in the prior wet season could have caused low food availability, so that by the following March, towards the end of the dry season, food was even more scarce than usual. Only about 200 mm of rain fell in the Nguru area during the 2004 wet season, compared to 600–800 mm in an average year. However a similar low rainfall occurred in N Nigeria in the 1973 wet season, immediately prior to the first year of the Kano study, so this cannot explain the difference between the two sets of results.

If general weather and climatic conditions are not implicated, the cause may be found in conditions local to Nguru. The environment of the Hadejia-Jama'are floodplain has recently undergone profound changes, as a result of extensive silting and blockage of several major river channels. Consequent diversion of flow into the northern sector of the floodplain has led to catastrophic flooding, and the growth of stands of *Typha* covering huge areas. All of these factors have resulted in a dramatic shrinkage in the area under cultivation (Anon. 2005), which is the main foraging habitat used by Yellow Wagtails in the area. Such habitat loss could explain not only the delay in pre-migratory fattening, but also many of the other findings, including the densely-packed population, which may be the result of a historically large population being squeezed into a declining area of habitat over a relatively short timescale. The

high level of aggression, seen particularly from territory-holding males, also fits with intense competition for shrinking resources.

The interpretation outlined above has implications for some fundamental aspects of the ecology of migrants during this critical phase of the annual cycle. The multiple signs of stress shown by the population provide circumstantial evidence for density dependent mortality in the form of poor body condition, and also possibly for lowered breeding success if delayed spring migration causes Nguru birds to lose out in competition for breeding territories with birds that have wintered elsewhere. This suggests that wagtails do not simply respond to loss of traditional wintering sites by moving elsewhere. If they did, population density would be expected to adjust rapidly, and there would be none of the social and physiological effects seen among the Nguru population. This in turn suggests that habitat loss in sub-Saharan wintering areas has the potential to contribute to overall population decline.

Acknowledgments

Thanks to Chris Otata-Odey and Ulf Ottosson of the A.P. Leventis Ornithological Research Institute and to Phil Hall for logistical support. Invaluable background on the situation in the Hadejia-Nguru Wetlands was provided by the Joint Wetlands Livelihoods Project.

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Biométrie en période de reproduction du Petit Calao à bec rouge *Tockus erythrorhynchus* au Sénégal

par Moussa Séga Diop

191 SICA de Mbao, BP 20077 Dakar-Thiaroye, Sénégal. <mousediop@yahoo.fr>

Reçu 20 juillet 2005; revu 13 avril 2006.

Résumé

Des relevés biométriques effectués sur 184 Petits Calaos à bec rouge *Tockus erythrorhynchus kempi*, capturés à la Réserve Écologique Expérimentale de Mbour, montrent une différence significative entre mâles et femelles aussi bien pour leur poids que pour les longueurs des ailes et du bec. Pendant quatre saisons de reproduction, les mesures hebdomadaires effectuées sur 43 femelles et 111 oisillons dans les nidoirs ont montré que le poids de la femelle enclose augmente considérablement et dépasse par moments celui des mâles. Après l'éclosion des œufs et durant l'élevage des jeunes, le poids des femelles encloses diminue entre les quatrième et huitième semaines de claustration alors que celui des oisillons augmente.

Summary

Biometrics of Red-billed Hornbill *Tockus erythrorhynchus* during the breeding period in Senegal. Biometrics of 184 Red-billed Hornbills *T. e. kempi* caught in the Experimental Ecological Reserve of Mbour show a significant difference between males and females for weight, wing length and bill length. During four breeding seasons 43 females and 111 chicks were monitored weekly inside sealed nest boxes. The weight of enclosed females increased considerably, sometimes even exceeding the males' weight. After hatching and during chick growth, the weight of the enclosed females decreased between the fourth and the eighth weeks after nest closure, whereas the weight of chicks increased.

Introduction

Les calaos sont caractérisés par leur reproduction durant laquelle la femelle (en dehors de deux espèces) s'enferme dans une cavité et rebouche l'entrée en y laissant une petite fente par laquelle elle reçoit la nourriture apportée par le mâle (Kemp 1976, Serle & Morel 1988). Au Sénégal, une des espèces de calao plus communes est le

Petit Calao à bec rouge *Tockus erythrorhynchus* (Morel & Morel 1990, Barlow & Wachter 1997). Les individus adultes trouvés au Sénégal, en Gambie et de la Guinée au Delta intérieur du Niger au Mali ont la peau périorbitale noire. Ces populations ont été nommées *T. e. kempi* (Tréca & Erard 2000, Delpont 2001). *T. erythrorhynchus* est inféodé à la savane arbustive et absent des savanes humides (Serle & Morel 1988). Cette espèce qui se reproduit normalement dans les cavités d'arbre, peut aussi occuper des nichoirs artificiels adéquats fixés dans des arbres. La femelle de *T. e. kempi* s'enferme dans le nid pour 53 jours en moyenne (Diop 1999).

Méthodes

Pour la capture des calaos des pièges sont posés à la Réserve Écologique Expérimentale de Mbour (REEM), Sénégal (14°23'N, 16°58'W). Cette réserve couvre une superficie de 70 ha de savane arbustive, de jardins et d'une lagune. En dehors des nichoirs, la capture des calaos est effectuée au moyen de nasses et de filets japonais. Trois nasses sont appâtées de graines d'arachide et placées à des endroits différents de la REEM. Les nasses utilisées fonctionnent de 07h00 au coucher du soleil et sont visitées toutes les 45–60 minutes. Des filets japonais, à une ou quatre poches de 2.5 m de haut et de 6, 8, 12, ou 15 m de long, sont placés à proximité des arbres et sont ouverts le matin de 07h00 à 11h00 et de 16h00 à 19h00. Les calaos capturés sont bagués (bagues métalliques du Muséum de Paris) afin de les reconnaître en cas de recapture. Les mensurations du tarse et du bec sont effectuées au moyen d'un pied à coulisse; celles de l'aile et de la queue avec une règle et celle du poids avec un peson. La date, le sexe, l'âge, le numéro de bague et les différentes valeurs biométriques sont relevés. Les données biométriques sur les jeunes ne concernent que les individus capturés dans les nasses ou dans les filets. Les juvéniles sont reconnaissables par la couleur de leur bec.

Le modèle de nichoir à toit amovible (Diop & Tréca 1993) permet d'en observer l'intérieur et de prendre les mesures telles que les variations pondérales des femelles encloses et des oisillons. Les prises de mesure et les observations des femelles encloses, du nombre d'œufs puis des oisillons sont effectuées à l'intérieur du nichoir muni de toit amovible et visité toutes les semaines. Afin de comparer ces données biométriques, une analyse de variance (ANOVA) est effectuée.

Résultats

Données biométriques

Les mesures biométriques concernent 74 adultes (43 mâles et 31 femelles) et 110 jeunes (57 mâles et 53 femelles). Les *T. e. kempi* présentent un dimorphisme sexuel aussi bien chez les adultes (Fig. 1) que chez les jeunes (Fig. 2). Les mâles sont plus

lourds que les femelles, aussi bien chez les adultes (182 ± 11 g contre 148 ± 10 g) que chez les jeunes (157 ± 12 g contre 136 ± 11 g). La longueur de la queue, de l'aile et du bec, est supérieure chez les mâles, aussi bien jeunes qu'adultes, la différence étant plus significative chez ces derniers (ANOVA, $P < 0.0001$), la croissance des jeunes continuant après leur sortie du nid.

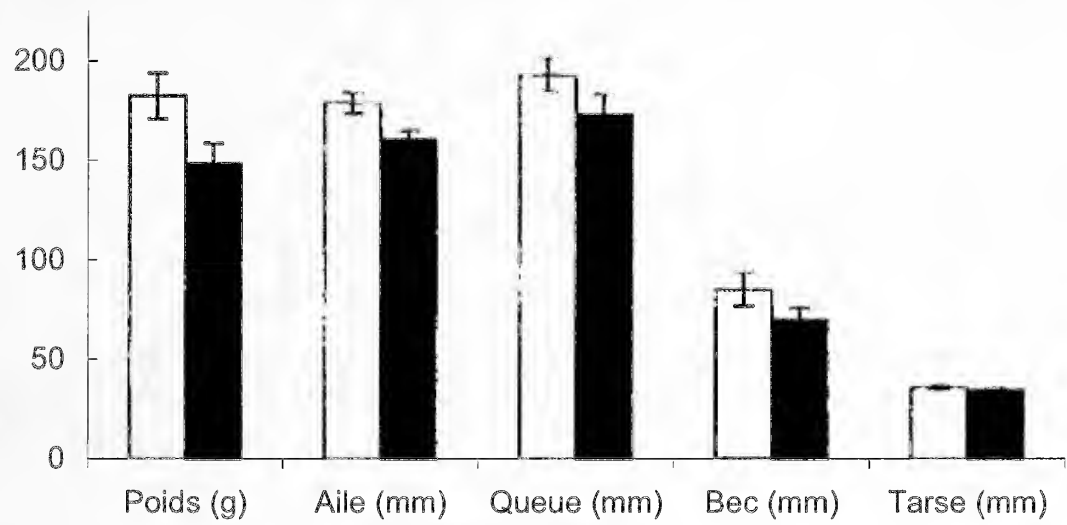


Figure 1. Biométrie sur les mâles (bandes blanches, $n = 43$) et les femelles adultes ($n = 31$) de *T. e. kempi*.

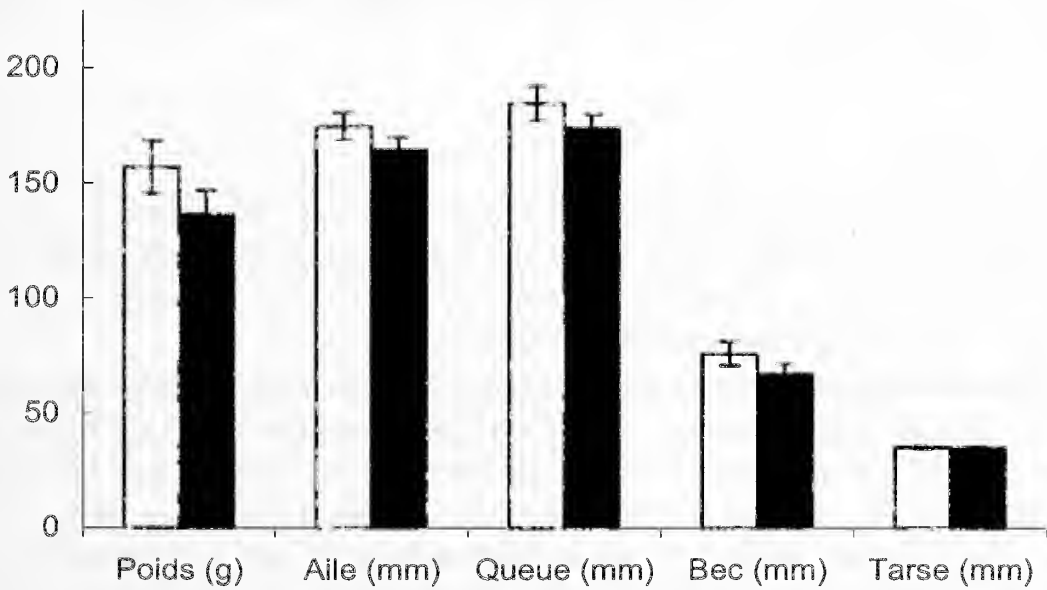


Figure 2. Biométrie sur les jeunes mâles (bandes blanches, $n = 57$) et femelles ($n = 53$) de *T. e. kempi*.

Femelles encloses

Aussitôt après leur claustration, les femelles perdent toutes leurs plumes de vol par une mue. Durant les six premières semaines de claustration, le poids des femelles augmente de 12% et dépasse celui de la femelle libre la plus lourde (165 g). Ce n'est qu'à partir de la septième semaine que le poids des femelles encloses reste inférieur au maximum de poids des femelles adultes libres. La diminution progressive du poids des femelles encloses (Fig. 3) n'a jamais atteint celui de la femelle adulte libre la plus légère (120 g).

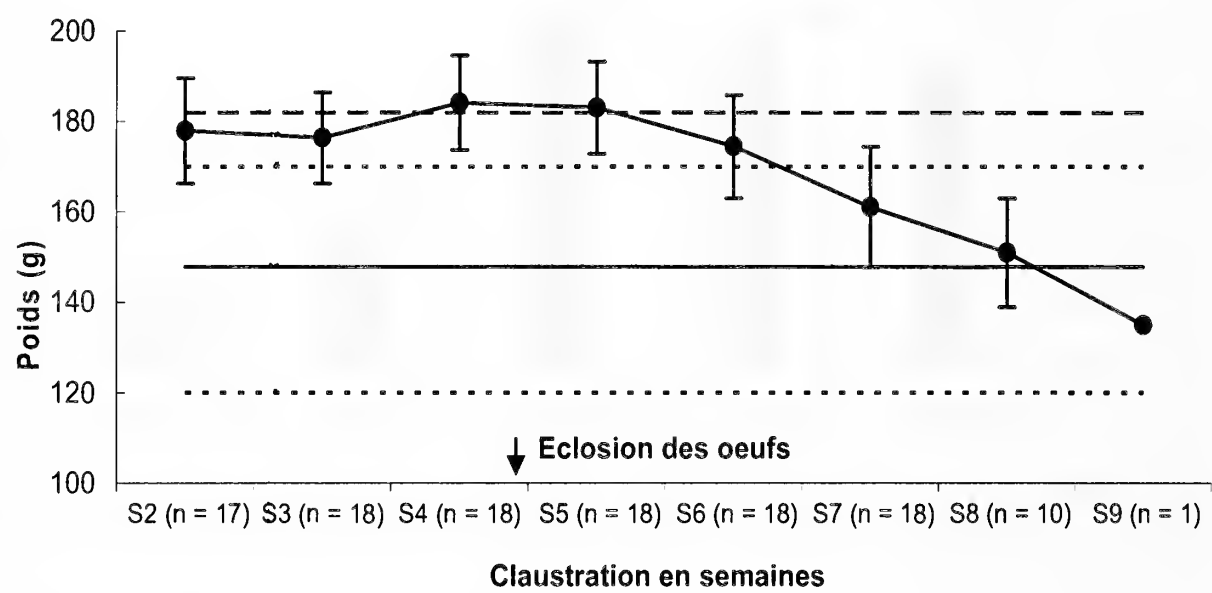


Figure 3. Poids moyen des femelles encloses de *T. e. kempii*, avec: - - - - poids maximal et minimal et ——— poids moyen des femelles adultes libres; - - - - poids moyen des mâles adultes.

Poids des oisillons

Les pesées hebdomadaires, à partir de la première éclosion, ont permis de constater qu'à l'intérieur d'un même nichoir le premier éclos possède un poids supérieur aux suivants durant les deux premières semaines. A partir de la troisième semaine, le poids de certains oisillons dépasse celui de leurs aînés (Fig. 4).

Le poids moyen des oisillons dans l'ensemble des nichoirs augmente rapidement durant les cinq premières semaines, la plupart d'entre eux atteignant alors leur poids maximal (Fig. 5). Durant cette période, il est multiplié par huit. Le bec de l'oisillon croît rapidement; sa longueur a quintuplé en six semaines d'âge (Fig. 5). La croissance se poursuit jusqu'à la sortie de l'oisillon du nid. Cependant la taille n'atteint pas le minimum de longueur (60 mm) chez tous les *T. e. kempii* jeunes et adultes observés en dehors des nichoirs. Le retard de croissance chez les derniers éclos, les derniers à sortir du nid, explique la diminution des moyennes de poids et de longueur de bec à partir de la semaine 6.

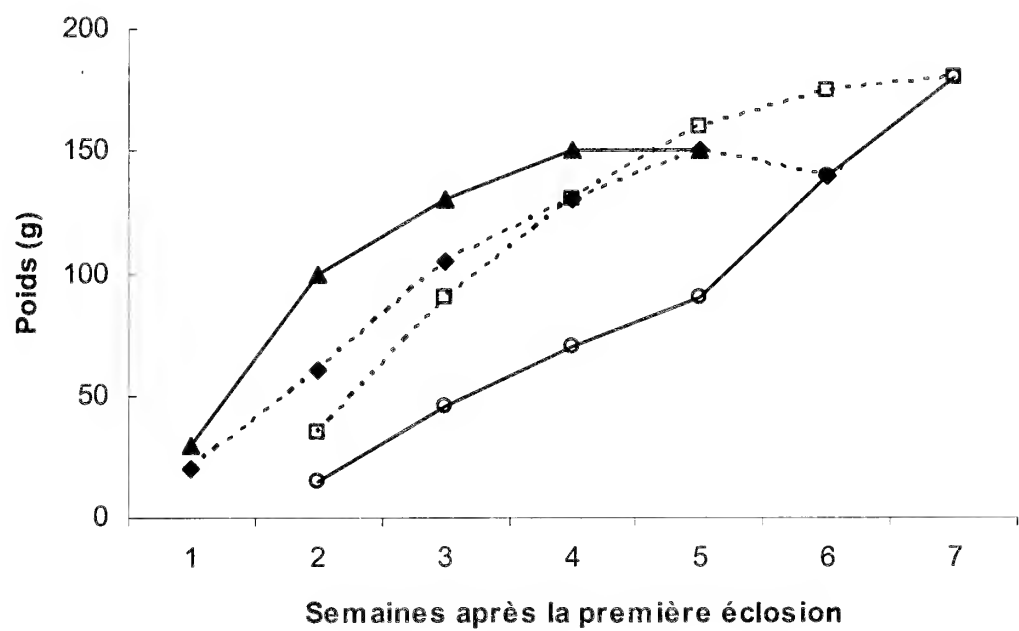


Figure 4. Exemples de variation du poids de quatre oisillons de *T. e. kempi* dans un seul nichoir.

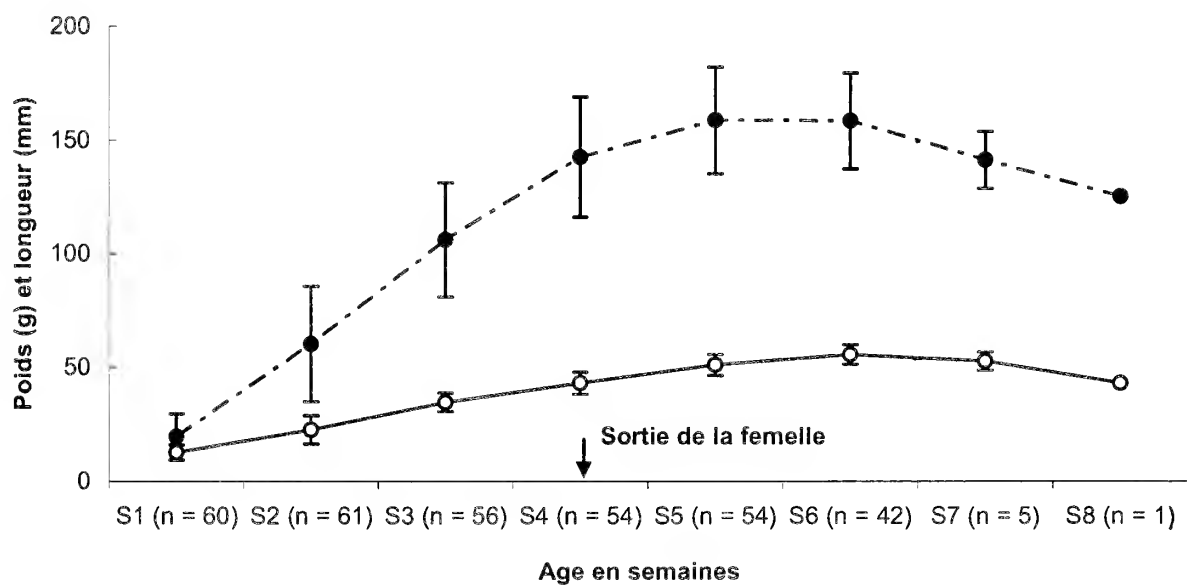


Figure 5. Variation de la moyenne du poids (cercles solides) et de longueur du bec des oisillons de *T. e. kempi* dans 33 nichoirs.

Discussion

La différence de taille entre les mâles et les femelles de *T. e. kempi* est significative. Les jeunes mâles ont leur poids et leur longueur de l’aile, de la queue et du bec

supérieurs à ceux des femelles de la espèce. Cette différence se manifesterait déjà dans le nid car certains oisillons d'un même nichoir pendant la même saison de reproduction ont parfois des tailles qui dépassent celles de leurs aînés (Diop 1999). La biométrie des oisillons dans un même nid permettrait, à six semaines d'âge, une détermination approximative du sexe des oisillons avant leur sortie du nid. Par contre pour les adultes, le problème ne se pose pas. Kemp (1995) a montré que les mâles de *T. erythrorhynchus* sont plus grands que les femelles. Mes observations effectuées au Sénégal ont donné les mêmes résultats.

Le dimorphisme sexuel des calaos déterminerait-il les tâches attribuées aux mâles et aux femelles. Sans tenir compte de la taille, Diop & Tréca (1996) ont montré le rôle dévolu à chaque conjoint durant la préparation du nid chez *T. e. kempi*. Selon Kemp (1995), la taille du bec des calaos joue un rôle dans la défense du territoire, l'attraction de la femelle et la recherche de nourriture pour la femelle enclose et pour ses poussins. Pour la variation pondérale de la femelle enclose, la taille des œufs ne semble pas très déterminant car même après la ponte, le poids de la femelle enclose reste largement supérieur à la moyenne de poids de leurs homologues libres. Par contre le facteur énergétique semble plus décisif. La femelle enclose dépense moins d'énergie. La sédentarité et la qualité de nourriture apportée par le mâle contribueraient alors à l'augmentation de poids des femelles encloses. Pour Kemp (1995) le poids de la femelle de Calao de Monteiro *T. monteiri* augmente pendant la période d'incubation puis chute après l'éclosion, la femelle utilisant alors ses réserves et laissant la nourriture apportée par le mâle aux oisillons. Nos observations sur *T. e. kempi* ont donné les mêmes résultats.

Remerciements

Pour leur disponibilité et leur soutien, je tiens à remercier sincèrement tout le personnel de l'IRD (ex ORSTOM) du Sénégal particulièrement Mamadou Sakho, Daouda Sylla, Pierre Reynaud, aux regrettés Pap Samb et Bernard Tréca. Ces remerciements sont aussi adressés aux correcteurs pour la pertinence de leurs commentaires.

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The birds of Mbam and Djerem National Park, Cameroon

by K. Serge Bobo¹, Eddie Williams², N. Dennis Anye³, M. Francis Njie³
Roger C. Fotso⁴ & Marc Languy⁵

¹Ministry of Forests and Wildlife, Direction of Wildlife and Protected Areas,
Yaoundé, Cameroon. <bobokadiri@yahoo.fr>

²6 Newbold Grove, Croxteth Park, Liverpool, L12 0NS, U.K. <eddieirene@aol.com>

³Cameroon Biodiversity Conservation Society,

PO Box 3055, Messa Yaoundé, Cameroon <cbcs@iccnet.cm>

⁴NYZS/The Wildlife Conservation Society Cameroon Biodiversity Project,
Yaoundé, Cameroon. <wcscam@aol.com>

⁵WWF-EARPO, PO Box 62440, Nairobi, Kenya <mlanguy@wwfearpo.org>

Received 3 December 2001; revised 20 April 2006.

Summary

In the first inventory of the avifauna of the recently established Mbam and Djerem National Park in central Cameroon, based on fieldwork carried out in March 2000, a list of 362 confirmed species was compiled. A number of species rare in Cameroon are documented and many records extend the known range of species to the north or south. These preliminary surveys show that Mbam and Djerem NP is the richest protected area in bird species in Cameroon.

Résumé

Les oiseaux du Parc National du Mbam et Djerem, Cameroun. Sur la base du premier inventaire des oiseaux effectué en mars 2000 dans le nouveau Parc National du Mbam et Djerem au centre du Cameroun, une liste de 362 espèces confirmées est donnée. Certaines espèces rares du Cameroun y sont aussi décrites et la distribution connue de beaucoup d'espèces s'est étendue vers le nord ou le sud. Ces premiers inventaires montrent que le PN du Mbam et Djerem est l'aire protégée la plus riche en espèces d'oiseaux de tout le Cameroun.

Introduction

The Mbam and Djerem National Park was gazetted in January 2000 and consists of 416,512 ha in central Cameroon, 50 km south of Tibati and 20 km northeast of Yoko. It lies between 5°30' and 6°14'N, and 12°20' and 13°15'E. The climate has two seasons of almost equal length: the rainy season from mid-April to mid-October and

the dry season from mid-October to mid-April. The annual rainfall is *c.* 1900 mm and the average annual temperature is 24°C. The vegetation is sudano-guinean, between the guinean dense forest of S Cameroon and the wooded savanna of the Adamaoua plateau. The habitat is primarily forest-savanna mosaic with an area of primary lowland rainforest in the south of the park. In the wooded savanna, the following trees dominate: *Annona senegalensis*, *Lophira lanceolata*, *Vitellaria paradoxa*, *Daniella oliveri*, *Azadirachta indica* and *Anogeissus leiocarpus*, with *Borassus aethiopium* near the Djerem river. *Hyparrhenia rufa*, *Imperata cylindrica* and *Pennisetum purpureum* dominate the herb layer. In forest areas there are more semi-deciduous plants like *Irvingia gabonensis*, *Enantia clauranta*, *Lophira alata* and *Triplochiton scleroxylon*. More details of the vegetation may be found in Maisels *et al.* (2000) and Maisels (2004). The relief is almost flat, but there is an altitudinal drop from 930 m to 650 m from the north to the south of the park. The park is bisected by a tributary of the Sanaga River known as the Djerem River, which passes through the Mbakaou reservoir 11 km north of the park (Fig. 1).

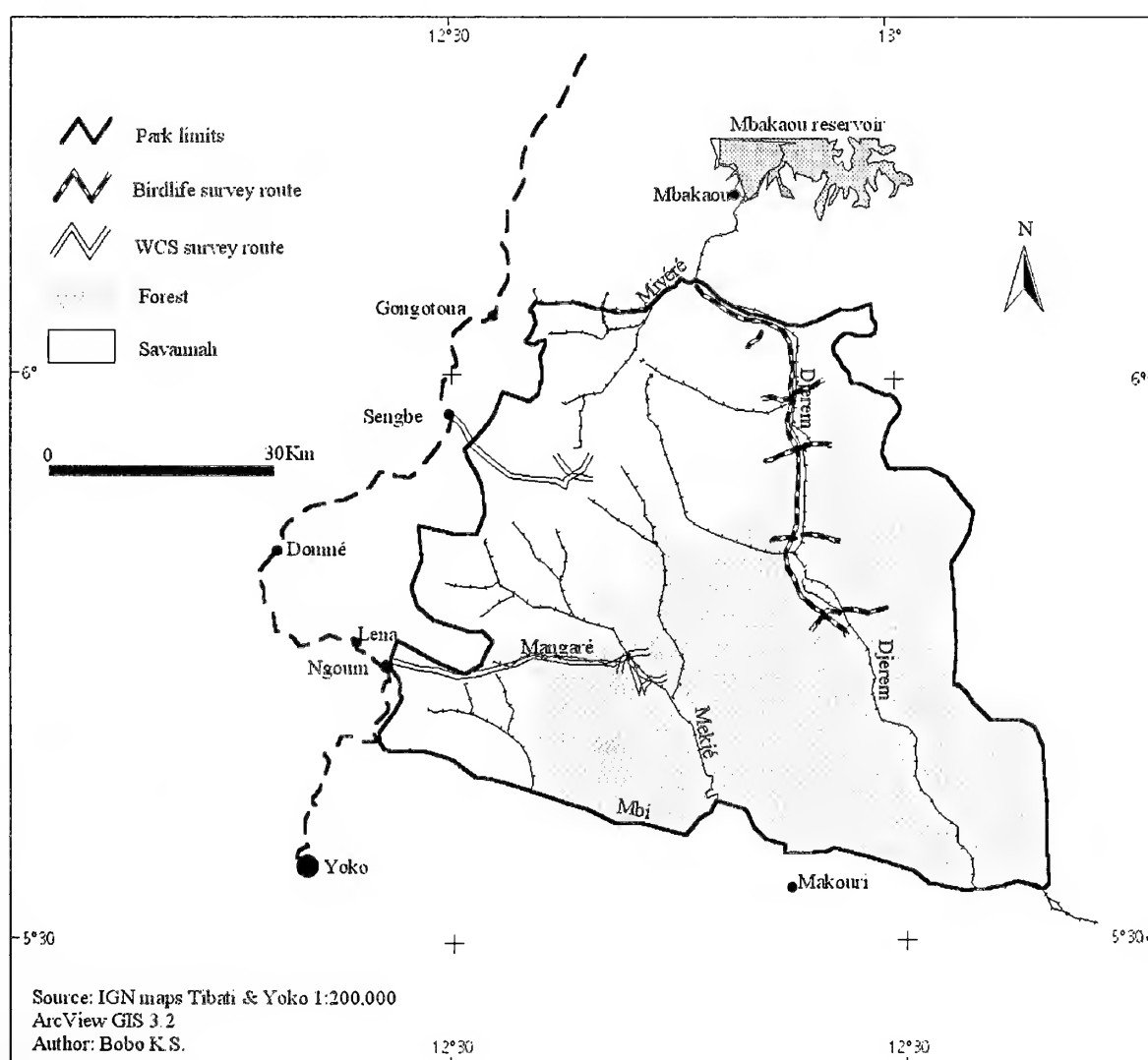


Figure 1. The study area.

Methods

Two teams surveyed the park in March 2000. The first team, composed of KSB, EW and DNA; carried out a survey 9–21 March as part of the Important Bird Areas (IBA) programme of Birdlife International, implemented by the former Cameroon Ornithological Club (COC), now known as the Cameroon Biodiversity Conservation Society (CBCS). This team entered the park from Mbakaou village at Miyéré waterfalls (6°12'N, 12°45'E), and followed the Djerem River south across forest-savanna mosaic and eventually into the lowland rainforest area towards the south of the park. A number of eastward and westward transects were made to cover areas distant from the river. The second team consisted of RF and MFN. This team surveyed two areas: the southwest and the northwest of the Park, for 12 and seven days respectively, in March 2000. Both surveys started at the western border of the park, respectively at 5°46'N (Ngum village) and 5°57'N (Sengbe village) going eastwards and southeastwards to about the centre of the Park (Maisels *et al.* 2000), and used a combination of observations whilst walking, song identification, and early morning mist-netting.

All bird species recorded by sight and sound were logged daily. We used the colour plates from Borrow & Demey (2001), kindly made available by the authors before publication. Many species were tape-recorded, especially those unsupported by visual identification, and tapes were later compared with Chappuis (2000). A few species were also filmed. Mist-netting was done by the WCS team, generally between 6h00 and 9h00.

Assessment of abundance follows Morel & Tye (1995): A = Abundant (11–100 may be seen or heard in suitable habitat per day); C = Common (1–10 may be seen or heard in suitable habitat per day); F = Frequent (often seen or heard but not every day); U = Uncommon (one or few records only). Habitats are: R = Riverine (Djerem River); LF = Lowland rainforest; GF = Gallery forest; F-S = Forest-savanna mosaic; S = Savanna; WS = Wooded savanna. Sequence and nomenclature follow Brown *et al.* (1982), Urban *et al.* (1986), Fry *et al.* (1988, 2000), Keith *et al.* (1992), Urban *et al.* (1997) and Fry & Keith (2004).

Results

Phalacrocoracidae

Phalacrocorax africanus Long-tailed Cormorant. C; R.

Ardeidae

Nycticorax nycticorax Black-crowned Night Heron. F; R.

Ardeola ralloides Squacco Heron. F; R within F-S.

Bubulcus ibis Cattle Egret. C; usually in association with small herds of domestic cattle in the north.

Egretta intermedia Intermediate Egret. F; R.

Ardea purpurea Purple Heron. One, Djerem River, 11 Mar.

A. melanocephala Black-headed Heron. F; R.

Scopidae

Scopus umbretta Hamerkop. C; R.

Ciconiidae

Anastomus lamelligerus African Openbill Stork. One, Djerem River, 12 Mar.

Ciconia abdimii Abdim's Stork. A; flocks of up to 200 recorded.

C. episcopus Woolly-necked Stork. U; R and WS.

Leptoptilos crumeniferus Marabou Stork. F; R and WS.

Threskiornithidae

Bostrychia hagadash Hadada. C; R.

Bostrychia rara Spot-breasted Ibis. F; R and GF.

Anatidae

Plectropterus gambensis Spur-winged Goose. One, Djerem River, 10 Mar.

Pteronetta hartlaubii Hartlaub's Duck. One in small pool within gallery forest, 11 Mar.

Accipitridae

Pandion haliaetus Osprey. One at the northern boundary of the park near Mbakaou, 20 Mar.

Macheiramphus alcinus Bat Hawk. One over the Djerem River, 13 Mar.

Milvus migrans Black Kite. A; throughout. Mainly *M. m. parasitus*.

Haliaeetus vocifer African Fish Eagle. F; R.

Gypohierax angolensis Palmnut Vulture. C; throughout.

Necrosyrtes monachus Hooded Vulture. U; WS and S.

Gyps africanus African White-backed Vulture. One adult at southern edge of the savanna mosaic at 5°57'N, 12°52'E, 14 Mar.

Circaetus cinereus Brown Snake Eagle. F; throughout.

Terathopius ecaudatus Bateleur. One adult over savanna, 12 Mar.

Polyboroides typus Harrier Hawk. F; throughout.

Circus aeruginosus European Marsh Harrier. F; mainly R.

Micronisus gabar Gabar Goshawk. U; S.

Accipiter tachiro African Goshawk. U; forest edge.

A. castanilius Chestnut-flanked Sparrowhawk. U; R and forest edge.

A. badius Shikra. U; S.

A. ovampensis Ovambo Sparrowhawk. An adult of the grey morph in flight over wooded savanna, 13 Mar, at 6°3'N, 12°50'E. This is outside the Jun-Dec period of most of the records to date for W Africa (*e.g.* Thiolley 1985, Barlow *et al.* 1997). The species possibly breeds in W Africa and may be more widespread than records suggest (Salewski 1998).

Urotriorchis macrourus Long-tailed Hawk. U; LF.

Butastur rufipennis Grasshopper Buzzard. One, WS, 11 Mar.

Kaupifalco monnogramicus Lizard Buzzard. U; LF.

Buteo buteo Common Buzzard. One in flight over wooded savanna at 6°7'N, 12°50'E, 10 Mar. Louette (1981) rejects one 1961 record. Since then there have been three more: Mt Oku, Oct–Nov 1988 (Holyoak & Seddon 1990), Feb 1998 (F. Dowsett-Lemaire & R.J. Dowsett pers. comm.); Yoko, Mar 99 (H. Slabbekoorn pers. comm.).

B. auguralis Red-necked Buzzard. C; mainly F-S.

Aquila wahlbergi Wahlberg's Eagle. Three sightings of adults over savanna, two dark phase and one pale phase individual.

Hieraaetus ayresii Ayres's Hawk Eagle.. An adult over gallery forest at 6°12'N, 12°45'E, 9 Mar. Reported with increasing frequency in Cameroon, where it was unrecorded until recently (Clark 1999).

Lophaetus occipitalis Long-crested Eagle. One over gallery forest in the north of the park, 9 Mar.

Stephanoaetus coronatus Crowned Eagle. U; GF. Well known to local hunters and constantly imitated by *Cossypha* spp.

Falconidae

Falco alopex Fox Kestrel. One, WS in central area of the park over the Djerem River. Unusual habitat for this species which is usually associated with rock outcrops.

F. chicquera Red-necked Falcon. U; WS and S.

F. cuvierii African Hobby. U; F-S.

Phasianidae

Francolinus lathamii Latham's Forest Francolin. U; LF.

F. squamatus Scaly Francolin. F; LF.

F. bicarcaratus Double-spurred Francolin. F; F-S.

Guttera pucherani Crested Guineafowl. U; LF.

Numida meleagris Helmeted Guineafowl. C; in the north.

Coturnix chinensis Blue Quail. One seen along the Ngoum–Yoko road in the south.

Rallidae

Sarothrura pulchra White-spotted Flufftail. F; GF.

Heliornithidae

Podica senegalensis African Finfoot. U; R.

Burhinidae

Burhinus senegalensis Senegal Thick-knee. F; R.

Glareola nuchalis Rock Pratincole. A; R.

Charadriidae

Pluvialis squatarola Grey Plover. One seen on sandbank along the Mékié River (5°46'N, 12°41'E) late in the afternoon.

Vanellus senegallus African Wattled Lapwing. F; R.

V. albiceps White-headed Lapwing. C; on the river.

V. superciliosus Brown-chested Lapwing. F; R. A pair defending a breeding territory against European Marsh Harriers, in grassy savanna alongside the Djerem River.

Scolopacidae

Tringa ochropus Green Sandpiper. U; R.

Actitis hypoleucos Common Sandpiper. C; R.

Columbidae

Treron waalia Bruce's Green Pigeon. F; forest edge.

T. calva African Green Pigeon. A; mainly GF and LF; occasionally WS.

Turtur brehmeri Blue-headed Wood Dove. U; LF.

T. tympanistria Tambourine Dove. U; GF and LF.

T. afer Blue-spotted Wood Dove. A; WS. F; LF.

Columba unicincta Afep Pigeon. F; F-S. Five at 6°3'N, 12°50'E, 12 Mar, constitute the northernmost records in Cameroon together with those at Takamanda (Languy & Njie 2003) and Ako (pers. obs.).

Streptopelia semitorquata Red-eyed Dove. A; throughout.

S. vinacea Vinaceous Dove. A; S.

Psittacidae

Psittacus erithacus Grey Parrot. F; LF.

Poicephalus gulielmi Red-fronted Parrot. U; LF.

Agapornis pullarius Red-headed Lovebird. F; WS.

Musophagidae

Corythaeola cristata Great Blue Turaco. C; LF and adjacent GF. Not in GF in the north.

Tauraco persa Green Turaco. F; GF.

T. leucolophus White-crested Turaco. U; heard in evenings north of the park, in a gallery forest at 5°59'N, 12°39'E.

Cuculidae

Oxylophus levaillantii Levaillant's Cuckoo. One seen near Mékié River crossing a burnt savanna.

Cuculus solitarius Red-chested Cuckoo. U; F-S.

C. clamosus Black Cuckoo C; throughout.

C. canorus European Cuckoo. One, F-S.

C. gularis African cuckoo. U; F-S.

Cercococcyx mechowi Dusky Long-tailed Cuckoo. F; LF and adjacent GF. Not in the north.

C. olivinus Olive Long-tailed Cuckoo. U; LF. Heard and netted.

Chrysococcyx cupreus Emerald Cuckoo. F; mainly LF; rarer in GF.

C. flavigularis Yellow-throated Cuckoo. F; GF north to 6°3'N, 12°50'E. Apparently absent from LF.

C. klaas Klaas's Cuckoo. C; throughout.

Ceuthmochares aereus Yellowbill. C; GF and LF.

Centropus senegalensis Senegal Coucal. F; S.

C. monachus Blue-headed Coucal. F; GF.

Strigidae

Otus senegalensis African Scops Owl. One heard at Mangare 2 (5°47'N, 12°36'E) and another along the Ngoum–Yoko road.

Bubo africanus Spotted Eagle Owl. Heard once at night in GF in the north of the park (5°57'N, 12°36'E).

Glaucidium tephronotum Red-chested Owlet. One heard at night in GF in the north of the park (5°57'N, 12°36'E).

Strix woodfordii African Wood Owl. F; GF and LF.

[*Scotopelia bouvieri* Vermiculated Fishing Owl. Although we did not record this species, local fishermen recognised the call from tape. They stated that birds stopped calling with the onset of the rains, which could account for our lack of records.]

Caprimulgidae

Caprimulgus climacurus Long-tailed Nightjar. F; S.

C. nigriscapularis Black-shouldered Nightjar. One singing in S in the north of the park, 19 Mar.

C. inornatus Plain Nightjar. A female, WS, 12 Mar.

C. tristigma Freckled Nightjar. One heard and one seen along the Ngoum-Yoko road, 21 Mar.

C. europaeus European Nightjar. One heard, in S in the north of the park., 19 Mar.

Macrodipteryx longipennis Standard-winged Nightjar. A male, WS, 19 Mar.

M. vexillarius Pennant-winged Nightjar. F; in shrubs along the Ngoum-Yoko road and along the Mékié River.

Apodidae

Rhaphidura sabini Sabine's Spinetail. F; LF and GF north to 6°8'N, 12°50'E.

Telocanthura ussheri Mottled Spinetail. U; flying over the Mékié River.

Neafrapus cassini Cassins Spinetail. F; LF and GF.

Cypsiurus parvus African Palm Swift. A; F-S.

Apus apus European Swift. C; in the north.

A. affinis Little Swift. C; in the north.

Tachymarptis melba Alpine swift. One sighting of two individuals at Mangaré 1 (5°46'N, 12°33'E) in the south.

Coliidae

Colius striatus Speckled Mousebird. C; mainly GF.

Trogonidae

Apaloderma narina Narina Trogon. F; GF.

A. aequatoriale Bare-cheeked Trogon. One in the forest 500 m from Mékié River.

Alcedinidae

Halcyon badia Chocolate-backed Kingfisher. C; GF and LF.

H. leucocephala Grey-headed Kingfisher. A; WS. Several breeding sites found.

H. malimbica Blue-breasted Kingfisher. C; GF and LF.

H. chelicuti Striped Kingfisher. C; WS.

Ceyx lecontei African Dwarf Kingfisher. Two netted in GF in the north.

C. picta African Pygmy Kingfisher. F; GF.

Alcedo leucogaster White-bellied Kingfisher. U; GF. One netted in GF in the north.

A. cristata Malachite Kingfisher. C; R.

A. quadribrachys Shining-blue Kingfisher. F; R.

Megaceryle maxima Giant Kingfisher. F; R.

Ceryle rudis Pied Kingfisher. U; R.

Meropidae

Merops gularis Black Bee-eater. F; GF. One found excavating a nest hole in a mud furrow within a gallery strip.

M. pusillus Little Bee-eater. A; S.

M. variegatus Blue-breasted Bee-eater. F; S.

M. albicollis White-throated Bee-eater. A; GF and LF.

Coraciidae

Eurystomus gularis Blue-throated Roller. U; LF.

E. glaucurus Broad-billed Roller. C; mainly WS.

Phoeniculidae

Phoeniculus purpureus Green Woodhoopoe. U; WS.

P. aterrimus Black Woodhoopoe. U; WS.

Upupidae

Upupa epops Hoopoe. F; WS.

Bucerotidae

Tockus albocristatus White-crested Hornbill. F; LF.

T. hartlaubi Black Dwarf Hornbill. One, LF at 5°52'N, 12°53'E, 17 Mar.

T. camurus Red-billed Dwarf Hornbill. C; GF.

T. fasciatus African Pied Hornbill. C; GF and LF.

Ceratogymna fistulator Piping Hornbill. C; GF and LF.

C. subcylindricus Black-and-white-casqued Hornbill. A; GF and LF.

C. albotibialis White-thighed Hornbill. C; LF, occasionally GF.

C. atrata Black-casqued Wattled Hornbill. C; LF and GF.

Capitonidae

Gymnobucco bonapartei Grey-throated Barbet. Two seen once at LF in the south.

G. peli Bristle-nosed Barbet. A group of 10 in LF at 5°52'N, 12°53'E, 17 Mar.

Pogoniulus scolopaceus Speckled Tinkerbird. C; LF and GF.

P. atroflavus Red-rumped Tinkerbird. F; LF and GF.

P. subsulphureus Yellow-throated Tinkerbird. C; LF and GF to 6°N, 12°52'E.

P. bilineatus Yellow-rumped Tinkerbird. A; LF; GF and WS.

Buccanodon duchaillui Yellow-spotted Barbet. C; LF and GF.

Tricholaema hirsuta Hairy-breasted Barbet. F; LF.

Lybius vieilloti Vieillot's Barbet. C; WS.

Trachyphonus purpuratus Yellow-billed Barbet. F; LF.

Indicatoridae

Indicator maculatus Spotted Honeyguide. F; LF and GF. Five netted, in south and north.

I. indicator Greater Honeyguide. F; WS.

I. minor Lesser Honeyguide. F; WS.

I. willcocksii Willcocks's Honeyguide. U; LF and GF.

Picidae

Jynx ruficollis Red-throated Wryneck. U; S.

Campethera abingoni Golden-tailed Woodpecker. U; S.

C. cailliautii Green-backed Woodpecker. F; LF and GF.

C. nivosa Buff-spotted Woodpecker. Two in GF in the north, 19 Mar.

C. caroli Brown-eared Woodpecker. F; GF along Mangaré stream (5°46'N, 12°32'E) in the south.

Dendropicos fuscescens Cardinal Woodpecker. F; GF.

D. xantholophus Yellow-crested Woodpecker. F; GF..

D. goertae Grey Woodpecker. U; WS.

D. obsoletus Brown-backed Woodpecker. U; S.

Eurylaimidae

Smithornis capensis African Broadbill. U; GF.

Hirundinidae

Psalidoprocne nitens Square-tailed Saw-wing. C; LF and GF.

P. pristoptera Black Saw-wing. A; LF and GF. Maximum 30, 9 Mar.

Riparia paludicola African Sand Martin. One sighting of two individuals along the Mékié River in the south.

R. riparia European Sand Martin. F; R. Maximum five, seen with *Hirundo preussi*, 10 Mar.

Pseudohirundo griseopyga Grey-rumped Swallow. U; R.

Hirundo senegalensis Mosque Swallow. U; R, WS and S.

H. abyssinica Lesser Striped Swallow. F; S.

H. daurica Red-rumped Swallow. U; R.

H. preussi Preuss's Cliff Swallow. C; R. Groups of up to five associated with other hirundines over the Djerem River.

H. aethiopica Ethiopian Swallow. U; Forest edge in the south.

H. rustica Barn Swallow. A; WS and S. A roost of over 5000 by the Djerem River in the north of the park.

Delichon urbica House Martin. C; WS and S. Maximum 10 together, 10 Mar. Usually with other hirundines.

Motacillidae

Motacilla flava Yellow Wagtail. A; WS and S. Races *flava* and *thunbergi* identified. Much less common where grazing cattle were absent.

M. clara Mountain Wagtail. U; along Mékié River in the south and along the Ngoum–Yoko road in the north.

M. aguimp African Pied Wagtail. C; R.

Anthus leucophrys Plain-backed Pipit. F; S. In more open areas of savanna, especially where recently burnt. Birds of race *zenkeri* appeared much paler both above and below than as illustrated in Keith *et al.* (1992).

A. trivialis Tree Pipit. A; WS and edges of GF. Up to 60 seen on a single day.

Macronyx croceus Yellow-throated Longclaw. F; S.

Campephagidae

Campephaga phoenicea Red-shouldered Cuckoo-Shrike. F; GF.

C. petiti Petit's Cuckoo-Shrike. F; GF.

C. quiscalina Purple-throated Cuckoo-Shrike. F; GF. Seen as far north as 6°8'N 12°52'E. All of the above three *Campephaga* species were occasionally present in the same mixed feeding party.

C. pectoralis White-breasted Cuckoo-Shrike. U; S.

Pycnonotidae

Andropadus virens Little Greenbul. A; GF.

A. virens Little Grey Greenbul. C; LF and GF.

A. ansorgei Ansorge's Greenbul. F; LF.

A. curvirostris Cameroon Sombre Greenbul. U; LF. Two netted in the south.

A. gracilirostris Slender-billed Greenbul. C; LF and GF.

A. latirostris Yellow-whiskered Greenbul. F; LF. Netted.

Baeopogon indicator Honeyguide Greenbul. A; LF and GF.

Chlorocichla flavicollis Yellow-throated Leaflove. A; GF and R. All were of ssp. *soror*.

Thescelocichla leucopleura Swamp Palm Greenbul. C; R.

Pyrrhurus scandens Leaflove. C; GF.

Phyllastrephus icterinus Icterine Greenbul. U; LF. One netted.

P. albigularis White-throated Greenbul. F; LF. Three netted.

Bleda syndactyla Red-tailed Bristlebill. F; LF and GF north to beyond the northern boundary of the park.

B. notata Lesser Bristlebill. U; LF.

Criniger chloronotus Eastern-bearded Greenbul. F; LF and GF.

C. calurus Red-tailed Greenbul. F; LF and GF.

Pycnonotus barbatus Common Bulbul. A; S, and forest edge.

Turdidae

Stiphornis erythrothorax Forest Robin. U; LF. Probably under-recorded.

Sheppardia cyornithopsis Lowland Akalat. U; LF. Two netted at Mékié River in the south.

Cossypha polioptera Grey-winged Robin-Chat. F; F-S, GF. Netted in the south and north.

C. cyanocampter Blue-shouldered Robin-Chat. U; LF along Djerem River.

C. natalensis Red-capped Robin-Chat. One sighting in primary forest along the Djerem River at 5°57'N, 12°52'E, 18 Mar. Until recently overlooked in Cameroon.

C. niveicapilla Snowy-crowned Robin-Chat. F; GF. Netted.

Alethe diademata Fire-crested Alethe. F; LF and GF.

A. poliocephala Brown-chested Alethe. C; LF and GF.

Neocossyphus rufus Red-tailed Ant-Thrush. F; GF. Formerly thought restricted to primary forest and, in Cameroon, only in the south and east (Louette 1981, Keith *et al.* 1992).

N. fraseri Rufous Flycatcher-Thrush. C; LF and GF.

Saxicola rubetra Whinchat. A; S. Most common in the north, up to 20 recorded per day.

Cercomela familiaris Familiar Chat. U; S.

Myrmecocichla nigra Sooty Chat. C; WS.

M. albifrons White-fronted Black Chat. F; WS. All birds encountered were of the white-shouldered variant.

Zoothera cameronensis Brown-eared Ground Thrush. One netted in forest understorey, 12 Mar.

Turdus pelios African Thrush C; GF.

Sylviidae

Bathmocercus rufus Black-faced Rufous Warbler. U; LF and adjacent GF.

Melocichla mentalis Moustached Grass Warbler. F; S with long grass.

Acrocephalus arundinaceus Great Reed Warbler. One in long grass in savanna, 19 Mar.

Hippolais pallida Olivaceous Warbler. U; GF.

H. icterina Icterine Warbler. U; S at Mékié River.

Cisticola erythrops Red-faced Cisticola. C; S.

C. cantans Singing Cisticola. U; WS.

C. lateralis Whistling Cisticola. A; S.

C. natalensis Croaking Cisticola. U; S.

Prinia subflava Tawny-flanked Prinia. A; long grass and scrub.

P. bairdii Banded Prinia. U; LF.

Schistolais leucopogon White-chinned Prinia. C; GF edge.

Apalis flavida Yellow-breasted Apalis. F; GF. Also in gardens in Mbakaou.

A. rufogularis Buff-throated Apalis. C; LF.

A. bamendae Bamenda Apalis. C; GF. Recorded from the northern boundary of the park south to 6°3'N, 12°50'E, in most gallery strips visited. These records further extend the range of this species (Bobo *et al.* 2001).

Camaroptera brachyura Grey-backed Camaroptera. A; S and F.

C. superciliaris Yellow-browed Camaroptera. F; LF.

C. chloronota Olive-green Camaroptera. C; LF, occasionally GF.

Macrosphenus flavicans Yellow Longbill. U; LF.

M. concolor Grey Longbill. F; LF.

Eremomela pusilla Senegal Eremomela. C; usually in small groups in WS.

E. badiceps Rufous-crowned Eremomela. F; forest edge along Mékié River.

Sylvietta brachyura Northern Crombec. F; S. A nest with young suspended c. 2.5 m from the ground in a bush, 12 Mar.

S. virens Green Crombec. C; LF and GF.

S. denti Lemon-bellied Crombec. U; LF.

Phylloscopus trochilus Willow Warbler. F; GF.

P. sibilatrix Wood Warbler. C; GF and LF edge.

Hypergerus atriceps Oriole Warbler. C; R in the north. Apparently absent from lowland forest.

Hyliota flavigaster Yellow-bellied Hyliota. F; WS and GF edge.

Hylia prasina Green Hylia. U; LF.

Muscicapidae

- Fraseria ocreata* Fraser's Forest Flycatcher. C; LF and GF.
F. cinerascens White-browed Forest Flycatcher. One netted in LF in the south.
Melaenormis edolioides Northern Black Flycatcher. F; WS.
Muscicapa striata Spotted Flycatcher. One, WS, 21 Mar.
M. gambagae Gambaga Flycatcher. F; S and forest edge.
M. caerulescens Ashy Flycatcher. F; GF.
M. cassini Cassin's Flycatcher. F; R.
M. adusta Dusky Flycatcher. F; GF.
M. comitata Dusky-blue Flycatcher. U; LF.
M. infusca Sooty Flycatcher. F; LF and adjacent GF.
Myioparus plumbeus Grey Tit-Flycatcher. C; F and S.
Ficedula hypoleuca Pied Flycatcher. F; WS and GF.

Monarchidae

- Erythrocercus mccallii* Chestnut-capped Flycatcher. C; LF.
Elminia longicauda African Blue Flycatcher. F; S and F edge.
Trochocercus nitens Blue-headed Crested Flycatcher. F; LF and adjacent GF.
Terpsiphone viridis African Paradise Flycatcher. C; GF and LF edge.
T. rufocinerea Rufous-vented Paradise Flycatcher. One with a mixed feeding party, LF; 17 Mar.
T. rufiventer Red-bellied Paradise Flycatcher. F; GF and LF.

Platysteiridae

- Megabyas flammulatus* Shrike-Flycatcher. U; LF.
Bias musicus Black-and-white Flycatcher. F; LF edge and GF.
Dyaphorophya castanea Chestnut Wattle-eye. F; LF. Eight netted.
D. tonsa White-spotted Wattle-eye. A male and a female netted together in GF.
D. chalybea Black-necked Wattle-eye. A singing bird in lowland forest along the Djerem River at c. 700 m, 5°56'N, 12°51'E, 18 Mar. Associated with submontane forest at 1050–1950 m in SW Cameroon but with lowland forest in the south.
Platysteira cyanea Scarlet-spectacled Wattle-eye. C; all habitats visited.
Batis senegalensis Senegal Batis. U; S.
B. minor Black-headed Batis. A; WS and F edge.

Timaliidae

- Illadopsis fulvescens* Brown Illadopsis. U; LF.
I. rufipennis Pale-breasted Illadopsis. F; LF and GF. Caught in net.
I. cleaveri Blackcap Illadopsis. F; LF.
I. puveli Puvel's Illadopsis. F; GF.
Ptyrticus turdinus Thrush-Babbler. C; GF.
Turdoides reinwardii Blackcap Babbler. F; R.
T. plebejus Brown Babbler. U; WS.

Paridae

- Parus leucomelas* White-winged Black Tit. C; WS.

P. albiventris White-bellied Tit. F; WS.

Anthoscopus parvulus West African Penduline Tit. U; S.

Certhiidae

Salpornis pilonotus Spotted Creeper. F; WS.

Nectariniidae

Anthreptes longuemarei Western Violet-backed Sunbird. F; GF.

A. seimundi Little Green Sunbird. A group of five in gallery forest, 12 Mar.

Deleornis fraseri Fraser's Sunbird. F; LF.

Cyanomitra verticalis Green-headed Sunbird. U; WS.

C. cyanolaema Blue-throated Brown Sunbird. C; GF and LF.

C. obscura Olive Sunbird. C; GF and LF.

Chalcomitra rubescens Green-throated Sunbird. F; LF and S.

Hedydipna collaris Collared Sunbird. F; GF.

H. platura Pygmy Sunbird. U; LF.

Cinnyris chloropygius Olive-bellied Sunbird. U; Forest edge.

C. reichenowi Northern Double-collared Sunbird. F; WS.

C. bouvieri Orange-tufted Sunbird. C; WS.

C. venustus Variable Sunbird. One (of the white-bellied morph) at the northern boundary of the park, 20 Mar.

C. coccinigastra Splendid Sunbird. C; GF.

C. cupreus Copper Sunbird. F; in or near GF.

Zosteropidae

Zosterops senegalensis Yellow White-eye. A; in all habitats visited.

Oriolidae

Oriolus oriolus European Golden Oriole. F; WS.

O. auratus African Golden Oriole. U; WS and S.

O. brachyrhynchus Western Black-headed Oriole. C; LF and GF.

O. nigripennis Black-winged Oriole. U; GF.

Malaconotidae

Nilaus afer Brubru. C; WS.

Dryoscopus gambensis Northern Puffback. C; GF.

D. senegalensis Black-shouldered Puffback. A; LF and GF.

D. sabini Sabine's Puffback. A male in GF in the north of the park, 20 Mar.

Tchagra minuta Marsh Tchagra. U; R.

T. australis Brown-crowned Tchagra. F; WS.

T. senegala Black-crowned Tchagra. C; WS.

Laniarus luehderi Lühder's Bush Shrike. U; LF along Mangaré stream (5°46'N, 12°36'E).

L. aethiopicus Tropical Boubou. C; WS and GF.

L. barbatus Yellow-crowned Gonolek. U; GF and WS.

L. leucorhynchus Sooty Boubou. F; GF.

Malaconotus bocagei Grey-green Bush Shrike. C; GF.

M. sulfureopectus Sulphur-breasted Bush Shrike. F; in or near to GF.

Nicator chloris Western Nicator. F; LF and Forest edge.

N. vireo Yellow-throated Nicator. F; GF. Usually considered a lowland forest species, it was seemingly absent from the forest block in the south.

Dicruridae

Dicrurus ludwigii Square-tailed Drongo. C; GF; WS.

Dicrurus atripennis Shining Drongo. C; GF and LF.

D. adsimilis Fork-tailed Drongo. F; WS.

D. modestus Velvet-mantled Drongo. U; LF.

Sturnidae

Grafisia torquata White-collared Starling. A; F-S.

Lamprotornis purpureiceps Purple-headed Glossy Starling. C; LF and adjacent GF. Absent from GF in the north.

L. chloropterus Lesser Blue-eared Starling. C; WS in the north only.

L. splendidus Splendid Glossy Starling. A; LF and GF.

Cinnyricinclus leucogaster Violet-backed Starling. A; WS and GF.

Passeridae

Passer griseus Grey-headed Sparrow. C; Forest edge and farmbush along the Ngoum–Sengbe road.

Petronia dentata Bush Petronia. A; WS.

Ploceidae

Ploceus nigricollis Black-necked Weaver. F; GF.

P. nigerrimus Vieillot's Black Weaver. A; R. Many breeding colonies along the river.

P. cucullatus Village Weaver. C; near villages.

P. tricolor Yellow-mantled Weaver. U; LF.

P. bicolor Dark-backed Weaver. C; LF and GF.

Malimbus nitens Blue-billed Malimbe. U; GF.

M. malimbicus Crested Malimbe. F; LF. Two seen with nesting material.

M. cassini Cassin's Malimbe. U; GF.

M. rubricollis Red-headed Malimbe. F; GF just north of the lowland forest block.

Quelea erythrops Red-headed Quelea. U; S.

Q. quelea Red-billed Quelea. A; WS.

Euplectes macrourus Yellow-mantled Whydah. A; WS.

Estrildidae

Nigrita canicapilla Grey-crowned Negrofinch. F; LF and GF.

N. fusconota White-breasted Negrofinch. C; GF and LF.

Pytilia hypogrammica Yellow-winged Pytilia. F; WS.

Spermophaga haematina Western Bluebill. U; LF.

Mandingoa nitidula Green Twinspot. U; GF. One netted in the south.

Clytospiza monteiri Brown Twinspot. U; WS.

Euschistospiza dybowski Dybowski's Twinspot. C; WS, especially in the north. Breeding at 6°7'N, 12°27'E, 21 Mar: both sexes apparently tending young in a rather large, untidy, spherical nest c. 3 m above ground in a bush alongside a large boulder.

Lagonosticta rara Black-bellied Firefinch. C; WS.

L. rufopicta Bar-breasted Firefinch. U; WS.

L. rubricata African Firefinch. A male with other seedeaters in S in the north, 20 Mar.

Estrilda melpoda Orange-cheeked Waxbill. C; WS.

E. nonnula Black-crowned Waxbill. U; WS.

Uraeginthus bengalus Red-cheeked Cordon-bleu. F; locally in the north only. Common just north of the park.

Lonchura cucullata Bronze Mannikin. C; WS.

L. bicolor Black-and-white Mannikin. U; WS.

Viduidae

Vidua macroura Pin-tailed Whydah. One near Sengbe on the western boundary of the park.

V. interjecta Exclamatory Paradise Whydah. A female in WS, 11 Mar. Identified primarily on known range and the presence in the area of its host *Pytilia hypogrammica* (Payne 1997).

Fringillidae

Serinus mozambicus Yellow-fronted Canary. C; WS.

S. gularis Streaky-headed Seed-eater. U; S.

Emberizidae

Emberiza tahapisi Cinnamon-breasted Rock Bunting. U; S.

E. affinis Brown-rumped Bunting. U; WS.

E. cabanisi Cabanis Bunting. F; WS.

Discussion

A total of 362 species was confirmed in the park. *Buteo buteo* was recorded for the fourth time in Cameroon. The records of *Accipiter ovampensis*, *Cossypha natalensis* and *Apalis flavida* all confirm the recent increase in records of these species that now appear more common and widespread than previously thought. *Grafisia torquata*, a typical species of transitional area was better represented in the park than in surrounding areas. Breeding was recorded for the uncommon *Vanellus superciliosus* and a nest of *Euschistospiza dybowskii* was found. The park contains substantial numbers of certain Palaearctic migrants, notably *Hirundo rustica*, *Anthus trivialis* and *Saxicola rubetra*.

The gallery forest strips contained an avifauna more distinct from the park's lowland forest than anticipated. Several species (e.g. *Chrysococcyx flavigularis*, *Neocossyphus rufus*, *Nicator vireo*) usually associated with lowland rainforest were found in the gallery forest but apparently absent from the lowland forest. *Apalis bamendae* was common in most gallery forests visited, further increasing its known range; in the extensive lowland rainforest towards the south it was replaced by *A. rufogularis*, suggesting that the two species are mutually exclusive (see also Bobo *et al.* 2001). Some forest species were found well to the north of their known range in

Cameroon, such as *Gymnobucco peli*, *Colomba unicincta*, *Fringilla lathami*, *Chrysococcyx flavigularis*, *Tockus hartlaubi* and *T. camurus*.

The inventory probably shows a bias towards gallery forest and savanna species against those of lowland rainforest. As the latter habitat occurs in the more remote regions of the park less time was spent there than would have been desirable to make an accurate assessment of its avifauna. It is likely that a significant number of forest species have therefore remained unrecorded. Some apparent absences may nevertheless be genuine, especially those of some otherwise common forest species such as Eastern Bearded Greenbul *Criniger chloronotus* and Naked-faced Barbet *Gymnobucco calvus*, mostly confined to the Atlantic forest in Cameroon. Several other otherwise abundant forest species were found in greatly reduced numbers. The fact that these forests lie so far to the north is likely to explain these absences. This forest area would greatly repay further scrutiny.

Large numbers of nightjars, including *Caprimulgus climacurus*, *C. nigriscapularis* and *Macrodipteryx longipennis* were observed at dusk along the Mbakaou-Tibati road just to the north of the park. It is therefore likely that these species were under-recorded inside the park.

With over 360 species confirmed for the National Park and at least a further 40 to be expected, Mbam and Djerem constitutes a priority area for conservation in Cameroon. One of the most interesting features of the site is its position at the ecotone between lowland forest and sudano-guinean savannas with an interrupted gradient and a complex mosaic between these two biomes. Should major climate changes occur in the next decades, this site would most likely conserve distinct components of both biomes and their bird species.

Acknowledgments

The visit of the BirdLife-COC team to Mbam and Djerem NP was part of the Important Bird Areas Project in Cameroon, sponsored by GEF-UNDP/BirdLife International. The second team was sponsored by WCS in the course of a multi-resources survey in the Park. We thank both institutions for their financial assistance. Many thanks to Dr Fiona Maisels for her advice. We also thank Emmanuel Yamga, Guy Ferdinand Tchappi, our guides Roland Mbarsola and Blaise Adamou and our canoeists Robert Sodeah and André Bouba. We also extend our thanks to the Chief of the village of Mbakaou for his hospitality.

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Les oiseaux du Parc National du Banco et de la Forêt Classée de l'Anguédedou, Côte d'Ivoire

par Olivier Lachenaud

1070 Avenue de Fès, 34080 Montpellier, France. <olivier.lachenaud@laposte.net>

Reçu 26 janvier 2004; revu 28 juin 2006.

Résumé

Le Parc National du Banco et la Forêt Classée de l'Anguédedou, qui comptent parmi les dernières forêts de la région d'Abidjan, étaient presque inconnus sur le plan ornithologique. Des visites régulières sur le terrain entre 1998 et 2002 ont permis d'identifier 198 espèces, dont cinq considérées comme menacées: le Calao à joues brunes *Bycanistes cylindricus*, l'Indicateur à pieds jaunes *Melignomon eisentrauti*, le Bulbul à queue verte *Bleda eximius*, le Bulbul à barbe jaune *Criniger olivaceus* et le Choucador à queue bronzée *Lamprotornis cupreocauda*, et une espèce à répartition restreinte, l'Apalis de Sharpe *Apalis sharpii*. La liste comporte des notes sur l'écologie, le chant et la nidification.

Summary

The birds of Banco National Park and Anguédedou Forest Reserve, Ivory Coast. The avifauna of Banco NP and Anguédedou FR, which are among the last remaining forests in the Abidjan area, was almost unknown. During regular visits in 1998–2002, 198 species were identified, including five threatened species: Brown-cheeked Hornbill *Bycanistes cylindricus*, Yellow-footed Honeyguide *Melignomon eisentrauti*, Green-tailed Bristlebill *Bleda eximius*, Yellow-throated Olive Greenbul *Criniger olivaceus* and Copper-tailed Glossy Starling *Lamprotornis cupreocauda*, and the Restricted-Range species Sharpe's Apalis *Apalis sharpii*. The list includes notes on ecology, voice and breeding.

Introduction

Le Parc National du Banco (PNB) et la Forêt Classée de l'Anguédedou (FCA) sont deux forêts mitoyennes situées aux environs immédiats d'Abidjan, capitale économique de la Côte d'Ivoire. Malgré leur facilité d'accès, ces forêts ont été

presque totalement délaissées par les ornithologues. Brunel & Thiollay (1969), Thiollay (1985) et Demey & Fishpool (1991) ne citent du PNB que sept espèces au total. D'autres observations plus anciennes sont dues à Paulian (1949), entomologiste qui se rendit au Banco durant l'été 1945 pour étudier la canopée, milieu alors inconnu. Paulian n'était pas un ornithologue et ne mentionne que neuf espèces d'oiseaux parmi les plus remarquables. Ces données sont néanmoins intéressantes, car deux espèces semblent aujourd'hui éteintes (*Corythaeola cristata* et *Ceratogymna atrata*). Aucune donnée n'est disponible concernant l'avifaune de la FCA.

Présentation du Parc National du Banco et de la Forêt Classée de l'Anguédédou

Le PNB et la FCA sont situés en périphérie nord-ouest d'Abidjan, à proximité immédiate de la lagune Ebrié, sur des plateaux d'altitude 50–100 m entrecoupés de vallées aux pentes très marquées. Les sols sont des sables tertiaires appauvris, typiques de la frange lagunaire de l'est de la Côte d'Ivoire.

Le PNB, couvrant 3200 ha, est encerclé aux sud, est et nord par l'agglomération d'Abidjan (communes d'Abobo, Adjamé et Yopougon). Il est traversé par la petite rivière Banco, qui prend sa source à la limite nord du parc et se jette dans la lagune Ebrié au pied de son entrée sud. En son centre se situent une école forestière, un arboretum, une ferme piscicole et un village. Le PNB fut classé Réserve forestière (l'une des trois premières de Côte d'Ivoire) en 1926. Des travaux sylvicoles (reboisement de zones défrichées et plantations d'enrichissement) y ont alors été menés jusqu'en 1953, date de son classement en Parc National. Depuis, les interventions humaines ont été très limitées en ce qui concerne les défrichements, 97% du parc étant encore boisé (Lauginie *et al.* 1996); un braconnage intensif a malheureusement entraîné la disparition des grands mammifères.

La forêt du PNB est une forêt sempervirente; De Koning (1982) et Lauginie *et al.* (1996) y distinguent quatre types de formations naturelles. La plus importante est la forêt de terre ferme psammohygrophile à *Turraeanthus africanus* et *Heisteria parvifolia*. Cette formation végétale, décrite par Mangenot (1955), croît sur des sols sableux tertiaires pauvres en argile, et couvre une étroite bande côtière dans l'est de la Côte d'Ivoire. Les arbres dominants des strates supérieures sont *T. africanus*, *Synsepalum afzelii*, *Berlinia confusa*, *Blighia welwitschii*, *Coula edulis*, *Dacryodes klaineana*, *Lophira alata*, *Petersianthus macrocarpus*, *Piptadeniastrum africanum*; la plupart de ces espèces sont communes dans toutes les forêts sempervirentes, mais les deux premières, abondantes ici, sont ailleurs beaucoup plus dispersées. Les strates dominées sont marquées par l'abondance de *Chrysophyllum subnudum*, *Drypetes chevalieri*, *Eriocoelum pungens*, *Monodora myristica*, *Tabernaemontana crassa* et *Xylopia acutiflora*.

Dans trois autres formations naturelles, l'avifaune, assez semblable à celle de la forêt de terre ferme, comporte cependant quelques espèces spécifiques (*Sarothrura*

pulchra, *Thescelocichla leucopleura*, *Cyanomitra cyanolaema*, *Lamprotornis cupreocauda*, *Ploceus albinucha*). L'une de celles-ci est la forêt marécageuse à *Mitragyna ledermannii*, *Alstonia boonei*, *Uapaca paludosa* et *Symphonia globulifera*, qui présente une canopée assez ouverte et un sous-bois dense où les palmiers (*Raphia*, *Laccosperma*) sont abondants. Le deuxième est la forêt périodiquement inondée, poussant sur des sols soumis à des inondations ou ruissellements temporaires (souvent en périphérie des forêts marécageuses). Les arbres *Hymenostegia afzelii*, *Sacoglottis gabonensis*, *Parkia bicolor* et *Coelocaryon oxycarpum* sont typiques de cette formation. La troisième est la forêt ripicole, localisée sur le cours supérieur du Banco et dominée par *Cynometra ananta* qui forme d'importants peuplements.

Du fait de l'exploitation passée (plantations) et actuelle (récolte de produits dérivés) par l'homme, la forêt du PNB reste une forêt secondaire âgée. Les ouvertures sont localisées aux alentours du village, au bord de la rivière et de certaines pistes. Les vieilles plantations forestières, d'espèces autochtones (Acajou Bassam *Khaya ivorensis*, Azobé *Lophira alata*) ou allochtones (Niangon *Tarrietia utilis*, Okoumé *Aucoumea klaineana*), antérieures à 1950, sont aujourd'hui plus ou moins intégrées à la forêt.

Les seuls milieux non forestiers du PNB sont les étangs de la ferme piscicole et leurs abords, quelques clairières autour du village et sur les lisières du parc, et les marais herbacés à *Cyrtosperma senegalense* qui bordent localement la rivière Banco.

Au nord-ouest du PNB, la FCA couvre 5700 ha dont la majorité sont occupés par des plantations industrielles d'hévéas *Hevea brasiliensis*. La surface restante est une mosaïque de forêt naturelle (quelques dizaines d'hectares seulement), de forêt dégradée, de plantations de reboisement (au total 1700 ha de surface boisée) et de clairières. Elle est arrosée par deux petites rivières, le Niangon à l'est et l'Anguédédou à l'ouest. L'autoroute du Nord (Abidjan-Yamoussoukro) la traverse.

Les formations forestières du PNB se retrouvent en FCA, mais sous un état beaucoup plus secondarisé, marqué par l'abondance d'arbres et arbustes héliophiles (*Cleistopholis patens*, *Harungana madagascariensis*, *Macaranga spp.*, *Musanga cecropioides*, *Pycnanthus angolensis* et *Tetrorchidium didymostemon*). Beaucoup de ces arbustes donnent des fruits très appréciés par les oiseaux; *Discoglypsemna caloneura* (Euphorbiaceae), par exemple, est l'une des rares espèces à fructifier en pleine saison sèche, où ses petits fruits d'un rouge vif attirent un très grand nombre d'oiseaux (au PNB, dix espèces comptées simultanément en février sur le même arbre) pour lesquels elle pourrait avoir une importance vitale. Les recrûs qui au PNB sont localisés aux alentours du village et au bord de certaines pistes, se trouvent un peu partout en FCA.

La majorité de la surface boisée est cependant occupée par des plantations forestières. Les essences les plus plantées sont *Khaya ivorensis*, le Framiré *Terminalia ivorensis*, le Fraké *T. superba* et le Samba *Triplochiton scleroxylon*, quatre espèces autochtones, et des essences allochtones comme *Aucoumea klaineana*, le Sao *Hopea odorata*, divers *Eucalyptus*, le Pin caraïbe *Pinus caribaea* et l'*Acacia*

mangium (Behagel & M'Bla 1998). Les plus vieilles plantations forestières datent de 1965; le sous-bois et les strates moyennes s'y sont partiellement reconstitués, ce qui permet la survie de certains oiseaux forestiers.

Les clairières sont nombreuses et souvent envahies par l'Herbe de Guinée *Panicum maximum*. Enfin, les plantations industrielles d'hévéas couvrent la plus grande partie de la "forêt classée". On trouve également quelques plantations d'agrumes, de cacaoyers et de bananiers.

La faune du PNB et de la FCA semble n'avoir fait l'objet d'aucune étude récente. Parmi les mammifères, le PNB abrite encore les Céphalophes bai *Cephalophus dorsalis* et de Maxwell *C. maxwelli*, le Guib harnaché *Tragelaphus scriptus*, le Pangolin à longue queue *Manis tetradactyla*, le Hocheur à nez blanc *Cercopithecus petaurista*, la Mone de Campbell *C. campbelli* (assez commune et facilement visible à l'entrée du parc) et au moins deux espèces d'écureuils (*Protoxerus stangeri* et *Paraxerus poensis*), tous observés au cours de cette étude. Béligné (com. pers.) mentionne également la présence de la Civette *Civettictis civetta*, de la Genette *Genetta genetta* et du Daman des arbres *Dendrohyrax dorsalis*. Plus surprenant, un petit groupe (10–15 individus) de Chimpanzés *Pan troglodytes* se maintient toujours. Les grands mammifères ont depuis longtemps disparu du parc. Seuls *Paraxerus poensis* et *Dendrohyrax dorsalis* ont été notés en FCA.

La flore de la région est riche de près de 850 espèces de phanérogames (Aubréville 1936, 1959, De Koning 1983, Aké Assi 2001–2), dont plus de 800 pour le seul PNB. Plus de 60 sont des endémiques ouest-africaines, dont certaines sont très rares, et quatre ne paraissent exister qu'aux environs immédiats de la ville d'Abidjan: *Albertisia cordifolia*, *Dichapetalum dictyospermum*, *Milletia takou* et *Tapinanthus praetexta*. *Macaranga beillei* a également une aire très restreinte dans la région d'Abidjan–Dabou. Ces espèces, qui peuvent être localement abondantes (du moins les deux premières) sont néanmoins très menacées et leur survie dépend pratiquement de celle du PNB.

Le climat du sud de la Côte d'Ivoire est de type subéquatorial à quatre saisons: deux saisons sèches (la "grande" de décembre à février et la "petite" en août–septembre) et deux saisons des pluies (grande de mai–juillet et petite en octobre–novembre). La pluviométrie moyenne annuelle est de 2000 mm, juin étant le mois le plus arrosé. La température moyenne est de 26°C, avec des valeurs mensuelles minima et maxima de 21°C et 32°C (Lauginie *et al.* 1996, Behagel & M'Bla 1998, De Koning 1983). L'humidité minimale moyenne est de 59% pour le mois le plus sec, janvier.

Méthodes

Ayant résidé à Abidjan de décembre 1997 à juillet 2002, j'ai pu visiter régulièrement ces deux forêts durant tous les mois de l'année, à l'exception de juillet et août. Les

données ici présentées sont presque entièrement basées sur mes observations ainsi que sur celles de Nathalie Armandy, Bruno Boedts et Hugo Rainey, résidents en Côte d'Ivoire durant la même période.

L'abondance sur les deux sites, l'habitat, la distribution verticale de l'espèce, ainsi que d'éventuelles informations sur la nourriture, le comportement ou la nidification, sont présentés. Concernant la distribution verticale, les hauteurs données sont très approximatives; (1)5–20 m signifie que l'oiseau occupe principalement les strates entre 5 et 20 m, descendant parfois jusqu'à 1 m. Les catégories d'abondance (Morel & Tye 1995) sont: A (abondant) >10 oiseaux observés ou entendus quotidiennement dans leur habitat; C (commun) 1–10 oiseaux observés/entendus quotidiennement dans leur habitat; F (fréquent) observé/entendu régulièrement, mais non quotidiennement, dans son habitat; U (peu commun): plusieurs observations par an; R (rare) moins d'une observation par an (espèces sédentaires); V (accidentel) moins d'une observation par an (espèces migratrices).

Les espèces disparues de la région, ou dont la présence est douteuse, sont signalées entre crochets. La nomenclature suit celle de Borrow & Demey (2001, 2004).

Résultats

Ardeidae

Ixobrychus sturmii Blongios de Stürm. PNB: un oiseau vu régulièrement, jan–mai 1988 à la ferme piscicole (Demey & Fishpool 1991).

Tigriornis leucolopha Onoré à huppe blanche. PNB: un oiseau en forêt marécageuse au bord du Banco, 4 sep 2002 (B. Boedts com. pers.).

Nycticorax nycticorax Bihoreau gris. PNB, F (étangs): sans doute résident (nombreux oiseaux encore présents en juin).

Butorides striata Héron strié. PNB, C (étangs). FCA: une seule observation au bord du Niangon.

Bubulcus ibis Héron garde-boeufs. FCA, U (clairières).

Ardea cinerea Héron cendré. PNB: 1–2 oiseaux vus régulièrement aux étangs, en hivernage.

Anatidae

Pteronetta hartlaubii Canard de Hartlaub. PNB: un oiseau aux étangs, nageant entièrement à découvert, 14 mai 2000. Probablement plus commun sur les rives boisées de la rivière, mais d'observation difficile.

Nettapus auritus Anserelle naine. PNB: une femelle aux étangs, 11 fév 2001.

Accipitridae

Aviceda cuculoides Baza coucou. PNB: un oiseau, 15 nov 1998 (B. Boedts com. pers.). Le statut de cette espèce en Côte d'Ivoire reste à préciser: Thiollay (1985) la dit sédentaire, mais dans la région côtière je ne l'ai vue qu'en saison sèche.

Pernis apivorus Bondrée apivore. PNB: un oiseau dans la forêt marécageuse au bord du Banco, 25 mar 2000.

Milvus migrans parasitus Milan noir. PNB, A; FCA, A (clairières).

Gypohierax angolensis Palmiste africain. PNB et FCA: trois observations seulement, forêt et plantations. Paulian (1949) rapporte qu'il était commun en 1945 et très apprécié pour sa chair, ce qui a sans doute causé sa forte diminution.

Dryotrionchis spectabilis Serpenteaire du Congo. PNB: un oiseau en forêt dense au coeur du parc, houspillé par des passereaux (notamment *Prionops caniceps*), 24 fév 1999. Les deux oiseaux que j'ai observés en Côte d'Ivoire présentaient une zone pâle à la base des rémiges primaires sur le dessus de l'aile; ce caractère n'apparaît sur aucune illustration.

Polyboroides typus Gymnogène d'Afrique. PNB, U; FCA, F: forêt dégradée, plantations et bords du Banco; absent de la forêt dense.

Circus aeruginosus Busard des roseaux. FCA: un mâle en vol au-dessus d'une clairière, 4 mar 2002.

Accipiter tachiro Autour tachiro. PNB, F; FCA, U. Forêt dense ou dégradée.

A. erythropus Epervier de Hartlaub. PNB: un mâle observé à l'arboretum, poursuivant un souimanga *Cyanomitra obscura*, jan 2000.

A. melanoleucus Autour noir. PNB et FCA: quatre observations au total, forêt dense et îlots forestiers.

Urotrionchis macrourus Autour à longue queue. PNB, F: forêt dense; un immature, oct. Semble absent de la FCA.

Kaupifalco monogrammicus Autour unibande. PNB: un oiseau à l'arboretum, 24 déc 2000.

Buteo auguralis Buse d'Afrique. FCA, U: clairières.

Hieraaetus ayresi Aigle d'Ayres. PNB: un immature aux étangs, 21 mai 2000. FCA: un adulte en vol au-dessus des plantations de *Khaya*, 1 juin 2000.

Spizaetus africanus Aigle-autour de Cassin. FCA: un oiseau chassant en vol au-dessus de la forêt, 24 mai 2000.

Stephanoaetus coronatus Aigle couronné. PNB: au moins un couple observé régulièrement au bord du Banco. Présence pour le moins surprenante, étant donné la faible superficie du parc et l'ampleur du braconnage. Risque de disparaître si la pression humaine continue à s'exercer.

Falconidae

Falco ardosiaceus Faucon ardoisé. FCA, R: clairières.

F. cuvierii Faucon de Cuvier. FCA, U: clairières.

F. biarmicus Faucon lanier. PNB: un immature observé à deux reprises aux étangs, fév 2002.

Phasianidae

F. achantensis Francolin d'Ahanta. FCA: une observation, de nombreux oiseaux, probablement en parade (très bruyants; courses, poursuites et sauts observés) dans les repousses sous une jeune plantation de *Terminalia*, 19 déc 2000.

Numididae

[*Guttera pucherani* Pintade huppée. PNB: présence rapportée par les guides, mais certainement éteinte aujourd'hui; aucun indice de sa présence (plumes) n'a été trouvé.]

Rallidae

Sarothrura pulchra Râle perlé. PNB, A; FCA, A. Forêt marécageuse ou de bas-fond.

Amaurornis flavirostra Râle à bec jaune. PNB, U (étangs).

Heliornithidae

Podica senegalensis Grébifoulque d'Afrique. PNB, F: sur le Banco, parfois aussi aux étangs.

Jacanidae

Actophilornis africana Jacana à poitrine dorée. PNB, A (étangs). Immatures presque toute l'année.

Charadriidae

Vanellus albiceps Vanneau à tête blanche. PNB: un oiseau aux étangs, 2 avr 2000.

Scolopacidae

Tringa ochropus Chevalier cul-blanc. PNB: un oiseau 2002 aux étangs, jan-fév.

Actitis hypoleucos Chevalier guignette. PNB, F (étangs).

Columbidae

Treron calvus Colombar à front nu. PNB, C; FCA, C. Forêt et vieilles plantations; mange les fruits de *Ficus* et *Musanga*.

Turtur brehmeri Tourtelette demoiselle. PNB: citée par Brunel & Thiollay (1969); un chant entendu provenait de cette espèce d'après H. Rainey.

T. tympanistria Tourtelette tambourette. PNB, F; FCA, C. Forêt marécageuse ou dégradée (non en forêt dense de terre ferme) et plantations; mange les fruits de *Pycnanthus angolensis*.

T. afer Tourtelette améthystine. FCA, C: clairières.

Columba iriditorques Pigeon à nuque bronzée. PNB, F en forêt dense. FCA, R, forêt dégradée et vieilles plantations de *Khaya*. Pic de chant en jan.

Streptopelia semitorquata Tourterelle à collier. PNB, R (en limite du parc); FCA, C. Clairières et plantations.

Psittacidae

Psittacus erithacus Perroquet jaco. PNB: un oiseau (sous-espèce non déterminée), juin 2002, probablement échappé de captivité.

Poicephalus senegalus Perroquet youyou. FCA, U: clairières, souvent avec *Psittacula krameri*.

Agapornis swindernianus Inséparable à collier noir. PNB: un *Agapornis* cité par Paulian (1949) ne peut être que cette espèce; observé deux fois en 2000 et 2001 (P. Yapo com. pers.). Rare en Côte d'Ivoire, quatre sites connus (Thiollay 1985, Demey & Fishpool 1991, 1994, Gartshore *et al.* 1995, Rainey & Lachenaud 2002).

Psittacula krameri Perruche à collier. PNB: une observation d'un petit groupe en vol au-dessus de la forêt. FCA, F: clairières et plantations d'*Eucalyptus*.

Musophagidae

[*Corythaeola cristata* Touraco géant. PNB: Présent en 1945 (Paulian 1949), disparu depuis.]

Tauraco macrorhynchus Touraco à gros bec. PNB, C; FCA, C. Forêt dense ou dégradée, 3–30 m, rare dans les vieilles plantations; membre occasionnel des rondes. Recherche les fruits de *Dialium dinklagei* dont il mange la pulpe blanche entourant la graine (P. Yapo com. pers).

Cuculidae

Oxylophus levaillantii Coucou de Levaillant. PNB et FCA: trois observations en lisière de forêt, pendant la grande saison sèche.

Cuculus solitarius Coucou solitaire. PNB, U, repéré uniquement par son chant.

C. clamosus Coucou criard. PNB, F: forêt dense, repéré uniquement par son chant. Semble absent de la FCA.

Cercococcyx olivinus Coucou olivâtre. PNB: un oiseau entendu et brièvement observé, 5 nov 2000.

Chrysococcyx cupreus Coucou foliotocol. PNB, A; FCA, C. Forêt et plantations (*Khaya*, *Terminalia*), 8–20 m, accompagnant parfois les rondes d'oiseaux.

C. flavigularis Coucou à gorge jaune. PNB: cité par Brunel & Thiollay (1969), non revu.

C. klaas Coucou de Klaas. PNB, C; FCA, C. Clairières, plantations et ouvertures en forêt (bords du Banco).

C. caprius Coucou didric. PNB, U; FCA, C. Clairières et ouvertures en forêt (bords du Banco).

Ceuthmochares aereus Malcoha à bec jaune. PNB, F, en forêt marécageuse, absent de la forêt dense de terre ferme. FCA, C: forêt dégradée et plantations, 5–30 m, toujours dans les secteurs riches en lianes. Membre fréquent des rondes d'insectivores; souvent en compagnie d'écureuils.

Centropus leucogaster Coucal à ventre blanc. PNB, U: entendu seulement en forêt marécageuse au bord du Banco. FCA, F: forêt marécageuse et plantations, 0–5 m, une fois dans une ronde d'insectivores.

C. senegalensis Coucal du Sénégal. PNB: une observation aux limites du parc en 1987 (R. Demey com. pers.). FCA, F: clairières.

Strigidae

Bubo poensis Grand-duc à aigrettes. PNB: deux observations en forêt marécageuse au bord du Banco, probablement plus commun.

[*Glaucidium capense* Chevêchette du Cap. La présence de cette espèce au PNB, signalée par Thiollay (1985) demande à être confirmée. Elle n'est pas connue de Yapo (Demey & Fishpool 1994) et habite normalement les forêts semi-décidues à voûte ouverte (F. Dowsett-Lemaire com. pers.)]

Apodidae

Rhaphidura sabini Martinet de Sabine. PNB, U: observé régulièrement, toujours 1–2 oiseaux, souvent en compagnie d'autres espèces (*Apus affinis*, *Cypsiurus parvus*,

Telacanthura ussheri). Jamais observé en FCA, bien qu'il soit adaptable à la forêt dégradée.

Telacanthura melanopygia Martinet de Chapin. PNB: un oiseau en vol au-dessus de l'arboretum, 25 mar 2000.

T. ussheri Martinet d'Ussher. PNB, C; FCA, C. Clairières et ouvertures en forêt, souvent avec d'autres martinets et hirondelles.

Neafrapus cassini Martinet de Cassin. PNB: bords du Banco, deux observations (1–2 oiseaux) en fév et juin.

Cypsiurus parvus Martinet des palmiers. PNB: A; FCA: A, au-dessus de la forêt et des clairières.

Apus apus Martinet noir. PNB, F; FCA, F, au-dessus des clairières; présent durant l'hivernage, jusqu'à la fin mai (plusieurs petits groupes, FCA, le 28 mai 2000).

A. affinis Martinet des maisons. PNB, A; FCA, A. Clairières et ouvertures en forêt (bords du Banco), en compagnie d'autres martinets et hirondelles.

Alcedinidae

Halcyon malimbica Martin-chasseur à poitrine bleue. PNB: un oiseau entendu, 30 mai 1987 (R. Demey com. pers.); aucune donnée supplémentaire malgré son chant typique.

H. senegalensis Martin-chasseur du Sénégal. PNB, F: étangs. FCA, F: clairières et très jeunes plantations.

Ceyx pictus Martin-chasseur pygmée. PNB: une observation en 1986 (R. Demey com. pers.). FCA: une seule observation en lisière de forêt.

Alcedo leucogaster Martin-pêcheur à ventre blanc. PNB: une observation sur le Banco près des étangs; probablement plus commun mais discret. Cri très aigu et assez faible, rappelant *Ceyx pictus*.

Ceryle rudis Martin-pêcheur pie. PNB: deux oiseaux aux étangs, 7 nov 2000. Abondant à quelques kilomètres de là, sur les bords de la lagune Ebrié.

Meropidae

Merops gularis Guêpier noir. PNB: deux oiseaux près de l'arboretum, 30 mai 1987 (R. Demey com. pers.).

M. pusillus Guêpier nain. PNB, R: limites du parc. FCA, F: clairières.

M. albicollis Guêpier à gorge blanche. PNB, A; FCA, F. Migrateur non nicheur (sep–mai), occupant tous les milieux y compris la canopée de la forêt dense.

Coraciidae

Eurystomus gularis Rolle à gorge bleue. FCA, U: plantations (*Terminalia*, *Eucalyptus*). Couple nourrissant un jeune (gorge brune, poitrine et ventre bleu-gris pâle), 28 mai 2000. Présence probable mais non confirmée au PNB.

E. glaucurus Rolle africain. FCA: un oiseau dans une clairière, 23 déc 2001.

Phoeniculidae

Phoeniculus castaneiceps Irrisor à tête brune. PNB, U: forêt dense, quatre observations (1–2 oiseaux) dont deux parmi des rondes d'insectivores.

P. bollei Irrisor à tête blanche. PNB: deux oiseaux en vol au-dessus du Banco, 6 fév 2000.

Bucerotidae

Tropicranus albocristatus Calao à huppe blanche. PNB, C; FCA, C. Forêt et vieilles plantations, 0–10 m; vu fréquemment suivre les groupes de singes.

Tockus fasciatus Calao longibande. PNB, A; FCA, A. Tous milieux; mange les fruits de *Guarea*. Assez rare en 1945 d'après Paulian (1949), peut-être bénéficié de la déforestation.

Bycanistes fistulator Calao siffleur. PNB, F; FCA, U. Forêt marécageuse ou de bas-fond, jamais loin des rivières et bien moins abondant que l'espèce précédente; d'après Paulian (1949) c'était pourtant l'inverse en 1945.

B. cylindricus Calao à joues brunes. PNB: un oiseau, 4 sep 2002 (B. Boedts com. pers.). Aucune autre observation de cette espèce pourtant facilement repérable n'ayant été faite, l'oiseau était probablement un visiteur: l'espèce est sujette à des migrations locales. Déjà rare en 1945 d'après Paulian (1949).

[*Ceratogymna atrata* Calao à casque noir. PNB: Commun en 1945 d'après Paulian (1949), semble aujourd'hui disparu.]

Capitonidae

Gymnobucco calvus Barbican chauve. PNB, C; FCA, C. Forêt et plantations, 10–40 m. Colonies actives en nov.

G. peli Barbican à narines emplumées. PNB, F; FCA, F. Mêmes milieux que l'espèce précédente (distinction difficile sur le terrain). Les deux espèces se nourrissent des fruits de nombreux arbres (*Ficus*, *Musanga*, *Pycnanthus*, *Cleistopholis*, *Psydrax*).

Pogoniulus scolopaceus Barbion grivelé. PNB, U; FCA, F. Recrûs, plantations, ouvertures en forêt (rivière Banco, bords des pistes), 3–20 m. Adulte nourrissant un immature avec des fruits de *Ficus exasperata* en fév (PNB); mange également les fruits de *Discoglyprema*.

P. subsulphureus Barbion à gorge jaune. PNB, C; FCA, C. Forêt et plantations. Mange les fruits de *Discoglyprema*. *P. bilineatus* n'existe pas dans la région. Il semble en fait être totalement absent de la zone forestière (obs. pers.) où il a été signalé probablement par confusion avec *P. subsulphureus*.

P. atroflavus Barbion à croupion rouge. PNB, F; FCA, F. Forêt et plantations. Identification basée uniquement sur le chant; l'oiseau n'a jamais été observé.

Buccanodon duchaillui Barbican à taches jaunes. PNB, U. Une observation en 1986 (R. Demey com. pers.); données personnelles basées uniquement sur le chant.

Tricholaema hirsuta Barbu hérissé. PNB, C; FCA, C. Forêt, recrûs et plantations (*Khaya*, *Terminalia*, *Triplochiton*), (5)8–25 m. Se nourrit des fruits de *Pycnanthus*, *Rauwolfia*, *Macaranga*; également membre occasionnel des rondes d'insectivores.

Lybius vieilloti Barbican de Vieillot. FCA: entendu à deux reprises dans une clairière en limite de la forêt classée.

Trachylaemus purpuratus Barbican pourpré. PNB, C; FCA, F. Forêt, surtout dans les bas-fonds; plus rarement dans les plantations.

Indicatoridae

Prodotiscus insignis Indicateur pygmée. PNB: un oiseau en sous-bois de forêt dense, à 2 m de haut, 24 fév 1999; vu capturer en vol un insecte sur un tronc. FCA: un oiseau

à 30–40 m de haut dans un arbre isolé dans une clairière, 24 déc 2001. Plusieurs autres observations probables.

Melignomon eisentrauti Indicateur d'Eisentraut. PNB: observation probable d'un immature, 7 avr 2002 (H. Rainey com. pers.). FCA: un oiseau à la lisière d'un îlot forestier et d'une vieille plantation de pins, à 4–12 m de haut, accompagnant une ronde d'insectivores du sous-bois (*Malimbus rubricollis*, *Terpsiphone rufiventer*, etc.), 25 nov 2001; vu chasser des insectes au vol à la façon d'un gobe-mouche; et capturer un insecte sur un tronc. Observé à quelques mètres et dans d'excellentes conditions, l'oiseau correspondait parfaitement à l'illustration dans Bowden *et al.* (1995). Les caractères suivants ont été notés: taille intermédiaire entre *Prodotiscus insignis* et *Indicator conirostris*; allure plus élancée que ce dernier et dos d'un vert olive nettement plus vif; dessous gris pâle (sans teinte verte sur la poitrine); rectrices externes presque entièrement blanches, avec de petites taches grises à leur extrémité; oeil sombre; bec jaune vif relativement fin pour un indicateur, pattes également jaune vif. Espèce découverte très récemment en Côte d'Ivoire, dans la moitié nord de la zone forestière (Rainey *et al.* 2003).

Indicator maculatus Indicateur tacheté. PNB: deux observations à l'arboretum.

I. conirostris Indicateur à gros bec. PNB, F; FCA, F. Forêt et vieilles plantations de *Khaya*, 5–20 m, fréquemment en compagnie de *Gymnobucco peli* que l'on suspecte être son hôte principal; une fois dans une ronde d'insectivores.

I. willcocksi Indicateur de Willcocks. FCA: deux oiseaux en lisière d'un îlot forestier, 16 sep 2001. Observés à quelques mètres de distance; identifiés par l'absence de moustache noire, la tête et la poitrine fortement lavées de vert olive (*I. exilis* et *conirostris* ont ces parties plus grises, et tous deux présentent une moustache noire); taille légèrement inférieure à celle d'*I. conirostris* et bec notablement plus petit. L'un d'eux explorait des trous de *Gymnobucco* (entrant presque entièrement à l'intérieur) dans un arbre mort à 5–10 m de hauteur, tandis que l'autre (mâle?) se tenait à quelques mètres à l'écart, peut-être pour détourner l'attention des barbus. Ceux-ci chassèrent ensuite le premier oiseau en poussant des cris très forts évoquant ceux d'un rapace. Il est donc possible que cette espèce parasite les *Gymnobucco*; ses hôtes sont encore inconnus (Fry *et al.* 1988). Rare en Côte d'Ivoire (Thiollay 1985, Demey & Fishpool 1991).

Picidae

Sasia africana Picumne de Verreaux. FCA: une femelle (pas de tache rousse au front) à la lisière d'une plantation de *Terminalia* et d'un îlot forestier, explorant les rameaux d'un arbre défeuillé à 5–10 m de haut, 3 nov 2000. Espèce rare en Afrique de l'Ouest: deux observations en Côte d'Ivoire (Demey & Fishpool 1994, Gartshore *et al.* 1995), deux au Libéria (Gatter 1997) et deux au Ghana (Macdonald & Taylor 1977, Dutson & Branscombe 1990).

Campethera nivosa Pic tacheté. PNB et FCA: seulement deux observations (1–2 oiseaux) dans les rondes du sous-bois, en forêt dense et dégradée.

C. caroli Pic à oreillons bruns. PNB: couple observé à deux reprises au même endroit,

dans une ronde d'insectivores du sous-bois.

Dendropicos gabonensis Pic du Gabon. PNB, U; FCA, F. Forêt dégradée (absent ou plus rare en forêt dense), recrûs et plantations de *Khaya*, 8–35 m. Tambourinage en nov.

D. pyrrhogaster Pic à ventre de feu. PNB, F; FCA, C. Forêt dense, mais surtout forêt dégradée et plantations (*Khaya*, *Terminalia*), (1)5–15 m. En couples, souvent dans les rondes d'insectivores.

Eurylaimidae

Smithornis capensis Eurylaïme du Cap. FCA: couple nourrissant un juvénile, à 10–15 m de haut en lisière de forêt marécageuse dégradée au bord du Niangon, 19 déc 2000. Distingué de *S. rufolateralis* (espèce de forêt dense), par la taille supérieure, le dessus moins sombre et nettement strié, et l'absence de coloration orange à la poitrine. Cette observation est surprenante, *S. capensis* habitant plutôt les marges nord de la zone forestière; plus au sud, il est signalé de Taï par Thiollay (1985), mais non par Gartshore *et al.* (1995).

Pittidae

Pitta angolensis Brève à poitrine fauve. PNB: un oiseau en jan 1979 (Nicole *in* Demey & Fishpool 1991); non revu depuis.

Hirundinidae

Psalidoprocne nitens Hirondelle à queue courte. PNB: quatre en vol au-dessus de l'arboretum, 25 mar 2000. Espèce commune à Yapo (Demey & Fishpool 1994, obs. pers.) mais très rare aux environs d'Abidjan (obs. pers.).

P. obscura Hirondelle fanti. PNB, A; FCA, A. Lisières, clairières et bords du Banco, en groupes atteignant souvent 20–30 oiseaux. Mue des rectrices en mar–avr.

Hirundo senegalensis Hirondelle des mosquées. FCA, F: fréquente au moins de sep à mai, en groupes atteignant 25–30 oiseaux, dans une clairière en limite de la forêt classée. Restreinte à l'extrême nord de la Côte d'Ivoire d'après Thiollay (1985), elle est aujourd'hui localement commune dans le sud (Lachenaud 2004). *H. semirufa*, fréquente autour d'Abidjan, n'a pas été observée au PNB/FCA.

H. abyssinica Hirondelle striée. PNB, A; FCA, A. Clairières et ouvertures en forêt. Nids occupés sous un pont en-dessous de l'autoroute (FCA), avr.

H. rustica Hirondelle de cheminée. PNB, C; FCA, C, en hivernage: clairières et bords du Banco.

Motacillidae

Anthus leucophrys Pipit à dos uni. FCA, F: clairières. Immatures en mai et sep.

Campephagidae

Coracina azurea Echenilleur bleu. PNB, U; FCA, U. Forêt dense, 15–40 m, généralement dans les rondes d'insectivores. En Côte d'Ivoire, semble nettement plus fréquent dans les forêts semi-décidues du centre de la zone forestière (Divo, Mopri) que dans le sud (obs. pers.).

Pycnonotidae

Andropadus virens Bulbul verdâtre. PNB, R: clairières aux alentours du village et au

bord du Banco. FCA, C: recrûs, jeunes plantations, fourrés dans les zones défrichées, 0–3 m; absent de la forêt où il est remplacé par *A. latirostris*.

A. gracilis Bulbul gracile. PNB, U; FCA, C. Recrûs et plantations, ouvertures en forêt (clairières, trouées, bords de pistes), peut-être aussi en forêt dense; souvent sur les arbres en fruits (*Harungana*, *Macaranga*) en compagnie d'autres *Andropadus*; membre occasionnel des rondes d'insectivores.

A. ansorgei Bulbul d'Ansorge. PNB, C; FCA, C. Forêt, rarement dans les vieilles plantations; 15–35 m (souvent plus bas sur les lisières). Membre régulier des rondes d'insectivores; se nourrit également de fruits (*Discoglypremna*, *Harungana*, *Macaranga*), souvent en compagnie d'autres *Andropadus*. Chant en mai–juin (saison des pluies); le reste de l'année seul le cri est émis.

A. curvirostris Bulbul curvirostre. PNB, C; FCA, C. Forêt, recrûs, plantations, 2–10 m; fréquemment dans les rondes d'insectivores; se nourrit également de fruits (*Cleistopholis*, *Harungana*, *Macaranga*) en compagnie d'autres *Andropadus*.

A. gracilirostris Bulbul à bec grêle. PNB, C; FCA, C. Forêt, plantations (*Khaya*, *Terminalia*, *Eucalyptus*...) et recrûs, (1)5–30 m. En couples ou en groupes (familiaux?) de 3–4, explore toutes les strates, mais principalement la canopée. Mange les fruits de l'herbe *Palisota hirsuta* et de nombreux arbustes (*Macaranga*, *Harungana*, *Rauwolfia*), souvent en compagnie des trois espèces précédentes.

A. latirostris Bulbul à moustaches jaunes. PNB, A; FCA, F. Forêt et vieilles plantations, 0–3 m; remplacé par *A. virens* dans les plantations plus jeunes. Parfois dans les rondes d'insectivores. Pic de chant de mai à nov.

Calyptocichla serina Bulbul doré. PNB, C; FCA, C. Forêt et vieilles plantations, (1)7–40 m. Seul ou par couples, habituellement dans les rondes d'insectivores; mange également les fruits de l'herbe *Palisota hirsuta*. Immature en sep, FCA.

Baeopogon indicator Bulbul à queue blanche. PNB, C; FCA, C. Forêt et vieilles plantations, 10–35 m; membre régulier des rondes d'insectivores, se nourrit également de fruits (*Discoglypremna*).

Ixonotus guttatus Bulbul tacheté. PNB, C; FCA, F. Forêt, 15–30 m; plus rare dans les recrûs (2–10 m) et les plantations. En petits groupes (jusqu'à 30 oiseaux), parfois dans les rondes d'insectivores; se nourrit également de fruits (*Discoglypremna*).

Chlorocichla simplex Bulbul modeste. FCA, F: clairières; vu se nourrir sur des *Harungana* et *Macaranga* en fruits, en compagnie d'*Andropadus* spp.

Thescelocichla leucopleura Bulbul des raphias. PNB, C; FCA, C. Forêt marécageuse, ne s'éloigne jamais des rivières.

Phyllastrephus icterinus Bulbul ictérin. PNB, U, toujours dans les rondes d'insectivores du sous-bois; jamais observé en FCA, alors qu'il est commun en forêt de Yapo (Demey & Fishpool 1994).

Bleda syndactylus Bulbul moustac. PNB: cité par Brunel & Thiollay (1969); un oiseau suivant une colonne de fourmis, 18 mar 2000.

B. eximius Bulbul à queue verte. PNB: 5–6 oiseaux suivant une colonne de fourmis, 25 déc 1998; un immature observé par H. Rainey (com. pers.).

B. canicapillus Bulbul fourmilier. PNB, U; FCA, A. Forêt dégradée (rare en forêt dense où il est sans doute en partie remplacé par ses deux congénères) et vieilles plantations de *Khaya*, 0–2 m. Membre souvent dominant des rondes du sous-bois. Pic de chant, nov–mar.

Criniger barbatus Bulbul crinon. FCA, U. Forêt marécageuse dégradée, souvent associé à *C. calurus* dans les rondes du sous-bois.

C. calurus Bulbul à barbe blanche. PNB, F; FCA, C. Forêt (semble préférer les bas-fonds) et vieilles plantations de *Khaya*, 0–3(10) m, toujours dans les rondes d'insectivores.

C. olivaceus Bulbul à barbe jaune. PNB: 2–3 oiseaux observés à deux reprises au même endroit, en sous-bois de forêt dense, parmi les rondes d'insectivores (avec notamment *C. calurus*), avr 2002. Abondance difficile à estimer en raison de sa discrétion; commun en forêt de Yapo (Demey & Fishpool 1994, obs. pers.). Septième site connu en Côte d'Ivoire (Thiollay 1985, Gartshore 1989, Demey & Fishpool 1991, 1994, Gartshore *et al.* 1995, Fishpool & Evans 2001). La diffusion du chant de *C. olivaceus* enregistré sur les disques de Chappuis (2000) déclenche des réactions territoriales chez *C. olivaceus*, mais également chez *C. calurus*, dans la forêt dense du PNB où les deux espèces cohabitent et s'associent au sein des mêmes rondes, mais également dans les plantations en FCA et dans la forêt-galerie du Bandama à Lamto, où seul *calurus* est présent.

Pycnonotus barbatus Bulbul commun. PNB, R: limites du parc; FCA, A: clairières et plantations. Mange les fruits de *Musanga* et de *Cleistopholis*.

Nicator chloris Bulbul nicator. PNB, F; FCA, F. Forêt marécageuse (absent de la forêt dense de terre ferme) et plantations.

Turdidae

Stiphrornis erythrothorax Rougegorge de forêt. PNB et FCA: deux observations, en forêt dense (PNB) et en lisière d'un îlot forestier (FCA). La rareté de cette espèce, commune en forêt de Yapo (Demey & Fishpool 1994) et facilement repérable par son chant, est remarquable.

Alethe diademata Alèthe à huppe rousse. PNB, C; FCA, C. Forêt et vieilles plantations, rarement observé mais localisé par son chant.

Stizorhina finschi Stizorhin de Finsch. PNB, A; FCA, C. Forêt dense (surtout dans les secteurs marécageux et les bas-fonds), plus rare dans les vieilles plantations, 1–7(15) m; seul ou par paires, parfois dans les rondes d'oiseaux. Chante toute l'année, pic marqué, sep–déc.

Sylviidae

Prinia subflava Prinia modeste. PNB, U: étangs. FCA, C: clairières.

Apalis nigriceps Apalis à calotte noire. FCA, F: canopée des îlots forestiers, descendant jusqu'à 6–7 m sur les lisières, toujours associée à certaines Mimosacées (*Piptadeniastrum* et la liane *Acacia pinnata*) dont elle explore le feuillage très fin, en compagnie d'autres petits insectivores.

A. sharpii Apalis de Sharpe. PNB, A; FCA, C. Abondante en forêt dense, rare dans

les vieilles plantations de *Khaya* et absente des plantations plus jeunes; (5) 10–40 m, parfois dans les rondes d'insectivores.

Camaroptera brachyura Camaroptère à tête grise. FCA, R: fourrés des clairières et repousses des jeunes plantations.

C. superciliaris Camaroptère à sourcils jaunes. PNB, U; FCA, C. Ouvertures en forêt (clairières, bords du Banco), recrûs et plantations, 2–10 m; absent de la forêt dense. Souvent dans les rondes d'insectivores.

C. chloronota Camaroptère à dos vert. PNB: entendu une seule fois au bord du Banco, absent de la forêt dense. FCA, C: sous-bois densément lianescents en forêt dégradée et dans les vieilles plantations, 0–5 m. Pic de chant avr–oct.

Macrosphenus concolor Nasique grise. PNB, A; FCA, A. Forêt et plantations, 3–15 m, toujours dans les rondes d'insectivores, explorant les rideaux de lianes. Un juvénile quémendant en avr, FCA.

Eremomela badiceps Erémomèle à tête brune. PNB: U; FCA, F. Canopée de la forêt dense, des îlots forestiers et des plantations de *Terminalia*, 15–30 m. En groupes de jusqu'à 20, toujours dans les cimes des *Terminalia* et *Piptadeniastrum*, membre fréquent des rondes d'insectivores. Immatures en mai.

Sylvietta virens Crombec vert. PNB, R; FCA, C. Lisières de forêt, plantations et recrûs, 1–10 m; souvent dans les rondes d'insectivores.

S. denti Crombec à gorge tachetée. PNB et FCA: trois observations en forêt dégradée, 5–20 m, toujours dans les rondes d'insectivores. Passe probablement inaperçue en canopée, en raison de sa petite taille.

Phylloscopus sibilatrix Pouillot siffleur. PNB: un oiseau en canopée de forêt secondaire au bord d'une piste, 25 mai 2002. Identifié par l'allure générale, le dessus vert olive assez vif, la gorge et le haut de la poitrine jaune vif contrastant nettement avec le reste du dessous blanc, le bec rougeâtre en vue de dessous. Observation exceptionnellement tardive: signalée au Libéria déc–avr (Gatter 1997), et au Ghana nov–avr, jusqu'à début mai dans l'extrême nord (Grimes 1987); en Côte d'Ivoire, Thiollay (1985) ne précise pas de dates.

Hylia prasina Hylia verte. PNB, C; FCA, C. Forêt, plantations, recrûs, 2–8 m; fréquemment dans les rondes d'insectivores. Transport de matériaux en mars, et couple nourrissant deux jeunes en nov sur le même site (FCA).

Muscicapidae

Fraseria ocreata Gobemouche forestier. PNB, C; FCA, C. Forêt périodiquement inondée (semble absent de la forêt dense de terre ferme), lisières et plantations (*Khaya*, *Terminalia*, *Tarrietia*), 2–15 m. Toujours en petits groupes (2–10); membre régulier des rondes (notamment avec *Ploceus albinucha*). Nourrissage de juvéniles, nov.

Muscicapa caerulescens Gobemouche à lunettes. PNB: deux observations en lisière de forêt. Espèce répandue surtout dans le nord de la zone forestière, mais déjà connue de San Pedro (Thiollay 1985) et Taï (Gartshore *et al.* 1995).

M. olivascens Gobemouche olivâtre. PNB: une seule observation, un oiseau dans un massif de bambous plantés au bord d'une piste dans la forêt dense, à 1.5–2 m de

hauteur, 5 nov 2000; il s'envola ensuite vers la canopée. Reconnaisable par son comportement typique de gobemouche (posture dressée, chasse les insectes au vol), le dessus uniformément brun, les lores grisâtres, la gorge et le ventre blancs, la poitrine et les flancs lavés de brun sans aucune strie. Les deux autres gobe-mouches bruns de la région (*M. striata* et *Melaenornis pallidus*) vivent dans des milieux ouverts; *M. striata* a la poitrine et la calotte nettement striées; *M. pallidus* est plus grand, a le bec plus robuste, un cercle oculaire pâle assez net, le dessous plus uniforme, et ses lores ne sont pas grisâtres. Espèce de canopée ne descendant que rarement en sous-bois (Brosset & Erard 1986).

M. comitata Gobemouche ardoisé. FCA, U: couple observé régulièrement sur le même site, en lisière de la forêt marécageuse bordant le Niangon, 1.5–5 m. Le chant caractéristique de *M. tessmannii* n'a jamais été entendu.

M. ussheri Gobemouche d'Ussher. PNB, F: Ouvertures en forêt (bords du Banco, arboretum), (8)20–40 m; peut-être aussi en canopée de forêt dense où son observation est difficile; généralement en petits groupes (max. 20). FCA, R: un oiseau en forêt marécageuse dégradée au bord du Niangon, sep.

Myioparus griseigularis Gobemouche à gorge grise. PNB: cité par Demey & Fishpool (1991), non revu. FCA: observé fréquemment sur un seul site dans le sous-bois dense d'une vieille plantation de *Khaya*, 2–10 m (peut-être aussi plus haut, mais difficile à voir). Se joint aux rondes d'insectivores, explorant les enchevêtrements de lianes; ne paraît pas chasser les insectes au vol, ce qui le distingue des *Muscicapa*. Le chant sifflé, fréquemment entendu, est assez différent des enregistrements de Chappuis (2000) provenant du Gabon. Il s'agit d'une phrase de cinq notes "tiouuu-ti-tiou-tiou-ti", de tonalité ascendante (et non descendante). Un chant similaire, enregistré en Côte d'Ivoire et présenté par Chappuis (2000) comme "variante" du chant de *M. plumbeus*, doit en fait être attribué à *M. griseigularis* (R. Demey *in litt.*).

M. plumbeus Gobemouche mésange. FCA: deux oiseaux à 10 m de haut dans la canopée d'une jeune plantation de *Terminalia*, 13 fév 2000. Espèce principalement soudano-guinéenne, rare et locale dans la zone forestière (Demey & Fishpool 1991, 1994, Gartshore *et al.* 1995).

Monarchidae

Terpsiphone rufiventer Tchitrec à ventre roux. PNB, C; FCA, C. Forêt, recrûs, plantations (*Khaya*, *Terminalia*, pins et même, rarement, hévéas), 2–7 m. Membre habituel des rondes d'insectivores du sous-bois, souvent avec *Dyaphorophya castanea*. Immatures en nov et avr.

Platysteiridae

Megabyas flammulatus Bias écorcheur. PNB, U: forêt dense, 15–40 m. Seul, par couples ou en petits groupes (jusqu'à 5–6), souvent dans les rondes d'insectivores; court sur les branches comme un échenilleux. Un mâle immature en avr. N'a pas été observé en FCA, bien qu'il s'adapte normalement à la forêt secondaire.

Bias musicus Bias musicien. FCA, C: clairières, recrûs et jeunes plantations; absent de la forêt; généralement en couples. Niche durant la grande saison des pluies: pic de

chant et comportement agressif (chasse *Dicrurus modestus*) mai-juin, couple nourrissant deux jeunes au nid en juin (N. Armandy com. pers.), une famille probable (un mâle et quatre femelles/immatrices), oct.

Dyaphorophya castanea Pririt châtain. PNB: C; FCA: C. Forêt dense et dégradée, plantations, 2–7 m; membre quasi constant des rondes d'insectivores du sous-bois, notamment en compagnie de *Terpsiphone rufiventer*. Immature, jan. L'une des appels de cette espèce, bien que très souvent entendue en Côte d'Ivoire, ne semble pas avoir été décrite: deux notes flûtées, la seconde plus basse: "ti...tou", assez faible, répété.

Batis poensis Pririt de Lawson. FCA: deux observations en lisière d'îlots forestiers, au sein des rondes d'insectivores de la canopée. Très difficile à détecter.

Timaliidae

Illadopsis fulvescens Akalat brun. PNB: citée par Demey & Fishpool (1991), non revue. FCA, F: sous-bois de la forêt dégradée et des vieilles plantations de *Khaya*, 0.5–3 m, parfois dans les rondes d'insectivores.

Remizidae

Pholidornis ruschiae Mésangette rayée. PNB: deux observations; FCA, F. Ouvertures en forêt (clairières, bords de pistes), plantations et recrûs, 1–10(35) m; en petits groupes (1–4), parfois dans les rondes d'insectivores.

Nectariniidae

Anthreptes rectirostris Souimanga à bec droit. PNB, U: régulier autour de l'arboretum, passe certainement inaperçu en canopée; en couples ou petits groupes. Mange les fruits de *Discoglyprema*; très attiré par les fleurs de *Turraeanthus*, mais pourrait y rechercher des insectes plutôt que du nectar.

A. seimundi Souimanga de Seimund. PNB, F; FCA, F. Lisières et ouvertures en forêt; passe peut-être inaperçu en canopée de forêt dense. Toujours en petits groupes monospécifiques (2–10 oiseaux) comme déjà souligné (Demey & Fishpool 1994). Souvent attiré par des fleurs pourtant peu voyantes (*Alstonia*, *Rauwolfia*, *Mitragyna*).

Deleornis fraseri Souimanga de Fraser. PNB, A; FCA, A. Forêt, plus rare dans les vieilles plantations, 2–10 (15) m. Toujours en petits groupes, membre quasi constant des rondes du sous-bois dont il pourrait être l'élément central (Fry & Keith 2000). Les oiseaux remuent fréquemment leurs ailes, peut-être comme un signal visuel.

Cyanomitra cyanolaema Souimanga à gorge bleue. PNB, A; FCA, A. Presque confiné à la forêt marécageuse, (1.5)10–25 m; visite rarement les plantations avoisinantes. Très associé aux fleurs rouges de *Symphonia globulifera*; lors de la floraison en fév-juin, chaque *Symphonia* en fleurs abrite de nombreux oiseaux, qui défendent chacun leur territoire contre leurs congénères et contre les individus d'autres espèces, comme déjà noté au Congo (Dowsett-Lemaire & Dowsett 1991). Il est possible que la distribution de l'arbre conditionne celle de l'oiseau. Défend également les fleurs de *Bombax*; attiré par celles de *Maranthes* et *Berlinia* mais semble y tolérer les autres espèces. Se nourrit aussi d'insectes (membre occasionnel des rondes) et même de fruits (*Alchornea*, *Discoglyprema*). Les vieux nids, suspendus à 5–10 m de hauteur, sont très visibles et restent intacts plusieurs mois après avoir été abandonnés.

C. olivacea Souimanga olivâtre. PNB, C; FCA, C. Forêt, plantations et recrûs, 2–10 m. Membre fréquent des rondes. Attiré par les fleurs de *Turraeanthus africanus* (mai).

Chalcomitra adelberti Souimanga à gorge rousse. PNB, F; FCA, C. Ouvertures en forêt dense (pistes, bords du Banco), forêt secondaire, lisières et plantations; en groupes (max. 15) ou par couples. Visite les fleurs de *Bombax*, *Albizzia* et de l'arbre introduit *Tabebuia rosea*; également membre régulier des rondes d'insectivores dans les cimes des *Terminalia* et *Piptadeniastrum*. Immatures en mar et sep.

Hedydipna collaris Souimanga à collier. PNB, C; FCA, A. Forêt dégradée, clairières, plantations et ouvertures en forêt dense (rivières, bord des pistes), 2–15 m. Membre fréquent des rondes d'insectivores, se nourrit également des fruits de l'arbuste endémique *Macaranga beillei*, et sans doute aussi de nectar (visite les fleurs d'*Albizzia* et de Loranthacées). Accouplement en fév (PNB); femelles nourrissant des jeunes, sep et mar; immatures avec quelques plumes vert métallique (indiquant le passage au plumage d'adulte), mar et mai (FCA).

Cinnyris chloropygius Souimanga à ventre olive. PNB, C; FCA, C. Clairières même petites, plantations et lisières, 2–8 m; absent de la forêt dense. Attiré par les fleurs de *Turraeanthus africanus* en mai.

C. minullus Souimanga minule. FCA: petit groupe dans un *Maranthes* en fleurs à 25 m de haut sur une lisière de forêt dense, en compagnie de *Cyanomitra cyanolaema* (sep). Peut-être plus commun mais très difficile à distinguer de *C. chloropygius*.

C. johannae Souimanga de Johanna. PNB, F; FCA, F. Canopée de la forêt et des vieilles plantations de *Khaya*, descendant plus bas en lisière et dans les recrûs; souvent dans les cimes de *Piptadeniastrum*. En couples (groupe de cinq en mai), attiré par les fleurs (*Anthocleista*, *Psydrax*, Loranthacées); membre occasionnel des rondes d'insectivores.

C. superbus Souimanga superbe. PNB, U; FCA, F. Lisières et plantations, absent de la forêt elle-même. Visite les fleurs (*Bombax* et Loranthacées) et chasse aussi les insectes (une fois dans une ronde). Femelle sur son nid (à c. 10 m de haut, accroché à des lianes *Acacia pinnata* en lisière), FCA, oct. La remarque de Fry & Keith (2000) sur son absence présumée au sud d'une ligne Taï–Yapo, est infondée; c'est justement dans le sud du pays que l'oiseau est le plus commun (Brunel & Thiollay 1969).

C. coccinigastrus Souimanga éclatant. FCA, F: clairières et jeunes plantations.

C. cupreus Souimanga cuivré. FCA, F: clairières.

Malaconotidae

Dryoscopus sabini Cubla à gros bec. PNB, F; FCA, F. Forêt et vieilles plantations de *Khaya*, 5–25 m (sans doute aussi en canopée), généralement dans les rondes d'insectivores. En FCA, femelle avec un jeune (bec rouge) quémendant en nov; deux mâles se querellant en présence d'une femelle en mar; les manifestations d'agressivité incluaient, en plus du cri présent sur le disque de Chappuis (2000), un trille similaire à celui de *Dendropicos gabonensis*, et des claquements du bec.

Prionopidae

Prionops caniceps Bagadais à bec rouge. PNB, C; FCA, C. Forêt dense ou dégradée,

(0)4–30 m; rare dans les plantations. En petits groupes de 3–10(20) qui suivent souvent les rondes d'insectivores. Chasse souvent les insectes au vol à la manière d'un gobemouche; vu également capturer un gros criquet au sol. Immatures déc–fév.

Oriolidae

Oriolus nigripennis Lorient à ailes noires. PNB: une seule observation: un oiseau à l'arboretum, dans une ronde d'insectivores, fév.

O. brachyrhynchus Lorient à tête noire. PNB, C; FCA, C. Forêt et plantations, (5)15–30 m. Seul ou par couples, accompagne les rondes d'insectivores. Adulte nourrissant un immature en jan (PNB). Contrairement aux affirmations de Thiollay (1985), c'est *O. brachyrhynchus* qui est le plus commun des deux loriots en forêt dense humide: *O. nigripennis* est rare (Balchin 1988, Demey & Fishpool 1994, obs. pers.) et préfère des milieux moins denses, comme les galeries et les plantations (obs. pers.).

Dicruridae

Dicrurus modestus Drongo modeste. PNB, C; FCA, C. Forêt, mais surtout lisières et plantations, (2)5–40 m, souvent dans les rondes d'insectivores. Adulte nourrissant un jeune avec une mante religieuse, FCA, 28 mai 2000.

Corvidae

Corvus albus Corbeau pie. PNB, R; FCA, F, en vol au-dessus des clairières.

Sturnidae

Poeoptera lugubris Rufipenne à queue étroite. PNB, U; FCA, U. Six observations (1–4 oiseaux) réparties sur toute l'année (jan–fév, juin, sep, nov). Affectionne les ouvertures en forêt (clairières, bords des rivières); généralement dans les cimes de *Piptadeniastrum*.

Lamprotornis cupreocauda Choucador à queue bronzée. PNB, C; FCA, F. Paraît lié à la forêt marécageuse bordant les rivières, 10–30 m; visite parfois les plantations avoisinantes. Souvent en petits groupes de 2–5 oiseaux, rarement jusqu'à 50 (juin). Mange les fruits de *Pycnanthus angolensis* (particulièrement) et de *Discoglypsemna caloneura*; également membre occasionnel des rondes d'insectivores. Probablement migrateur partiel: plus rare fév à mi-mai. D'après Gatter (1997), favorisée par la destruction de la forêt, mais ici cela semble être précisément le contraire.

L. splendidus Choucador splendide. PNB, U; FCA, C. Forêt marécageuse le long des rivières, mais abondant surtout dans les plantations (*Khaya*, *Eucalyptus*), 25–50 m; absent de la forêt dense de terre ferme.

Cinnyricinclus leucogaster Spréo améthyste. PNB, U; FCA, C. Migrateur, sep–fév; clairières, mêmes petites (alentours du village au PNB) et bords du Banco; vols de 50–100 oiseaux en FCA.

Ploceidae

Ploceus nigricollis Tisserin à cou noir. PNB, R: lisières du parc. FCA, C: clairières, jeunes plantations, lisières forestières; membre fréquent des rondes d'insectivores.

P. nigerrimus Tisserin noir. PNB, R: limites du parc. FCA, C: clairières et jeunes plantations (bambous, *Acacia mangium*) où il niche par centaines.

P. cucullatus Tisserin gendarme. PNB, R: limites du parc. FCA, C: clairières et

plantations d'*Acacia mangium* (niche avec l'espèce précédente).

P. tricolor Tisserin tricolore. PNB, C; FCA, C. Forêt et plantations, 7–30(50) m. Membre habituel des rondes d'insectivores. Colonies (jusqu'à 50 nids) dans les grands arbres, occupées sep–avr.

P. albinucha Tisserin de Maxwell. PNB, A; FCA, U. Limite entre les forêts marécageuses et de terre ferme (formations périodiquement inondées et ripicoles), (5)10–40 m; visite également les plantations avoisinantes en FCA mais s'éloigne peu des rivières. Toujours en groupes (max. 30), parmi les rondes d'insectivores qu'il domine souvent numériquement; une des espèces les plus abondantes de son milieu alors qu'il est généralement rare à peu commun. Immatures déc–avr.

Malimbus nitens Malimbe à bec bleu. PNB, C; FCA, C. Forêt et plantations, 0.5–5 m; toujours dans les rondes d'insectivores. Un immature en nov.

M. malimbicus Malimbe huppé. FCA, U: forêt dégradée et vieilles plantations, 2–15 m. Seul ou par paires, toujours dans les rondes d'insectivores en compagnie d'autres malimbes (*M. nitens*, *M. rubricollis*). Un mâle immature en mai. N'a pas été observé au PNB.

M. scutatus Malimbe à queue rouge. PNB, U; FCA, F. Forêt marécageuse (niche dans les palmiers) et plantations avoisinantes; lisières forestières. Nids en fév; un immature en déc (PNB).

M. rubricollis Malimbe à tête rouge. PNB, A; FCA, A. Forêt et plantations, (5)10–30 m, toujours associé aux rondes d'insectivores. Nids occupés nov–avr.

Estrildidae

Nigrita canicapillus Nigrette à calotte grise. PNB, C; FCA, C. Forêt, recrûs et plantations, 5–40 m. Seul ou par couples (neuf oiseaux ensemble, mai). Membre fréquent des rondes; très attiré par les fruits de *Discoglypremma*, en compagnie de l'espèce suivante. Transport de matériaux (bourre de kapok), sep; nombreux immatures jan–mai.

N. bicolor Nigrette à ventre roux. PNB, C; FCA, C. Mêmes milieux que l'espèce précédente mais généralement plus bas (2–15 m). Membre habituel des rondes d'insectivores; se nourrit également de fruits (*Discoglypremma*). Transport de matériaux en déc.

N. fusconotus Nigrette à ventre blanc. FCA: deux oiseaux en lisière de forêt marécageuse, 13 oct 2000.

Estrilda melpoda Astrild à joues oranges. PNB, C (étangs); FCA, C (clairières).

Spermestes cucullatus Capucin nonnette. PNB, C (étangs); FCA, C (clairières).

S. bicolor Capucin bicolore. PNB, C (autour du village); FCA, C (clairières).

S. fringilloides Capucin pie. FCA: deux observations de petits groupes, en compagnie de *S. cucullatus* et *S. bicolor*, dans les clairières envahies par l'herbe *Panicum maximum* dont il mange les graines. Immatures en déc.

Viduidae

Vidua macroura Veuve dominicaine. FCA, C: clairières.

Analyses et discussion

Au total 198 espèces ont été identifiées, 166 au PNB et 147 en FCA. La majorité d'entre elles sont sédentaires; 15 seulement sont migratrices, dont huit d'origine paléarctique et sept d'origine africaine. Le statut de *Ixobrychus sturmii* et *Aviceda cuculoides* est indéterminé.

Cette liste est évidemment incomplète; les espèces plus silencieuses ou difficiles à reconnaître par leur chant ont pu facilement passer inaperçues. De surcroît, ni captures au filet, ni visites de nuit n'ont été faites, ce qui explique notamment le peu de données pour les Strigidae. Une partie des absences notables sont cependant réelles: les oiseaux de grande taille (*Guttera*, *Corythaeola*, *Ceratogymna*) sont aujourd'hui éteints, victimes du braconnage intensif.

L'avifaune du PNB-FCA est dans l'ensemble très proche de celle de la forêt de Yapo, distante de 40 km (Demey & Fishpool 1994). Une absence est cependant remarquable, celle du Gobemouche à tête rousse *Erythrocerus mccallii*, commun à Yapo, mais jamais observé au PNB-FCA; cette espèce, malgré sa petite taille, est très reconnaissable et d'observation facile. Deux espèces qui comptent parmi les plus abondantes à Yapo, *Phyllastrephus icterinus* et *Stiphrornis erythrothorax*, sont rares au PNB-FCA; à l'inverse, *Ploceus albinucha*, peu commun à Yapo, est abondant au PNB. Parmi les facteurs susceptibles d'expliquer ces différences, la composition floristique différente (la forêt de Yapo appartient au groupement à *Diospyros* spp. et *Mapania* spp., qui est floristiquement plus riche et compte de nombreuses espèces exclusives), les précipitations légèrement supérieures au PNB-FCA (environ 2000 mm par an contre 1750 à Yapo) et le relief (presque plat à Yapo, nettement vallonné au PNB-FCA).

Comparaison PNB-FCA

Les différences observées entre l'avifaune des deux forêts sont dues à la présence des étangs (oiseaux aquatiques) mais surtout au meilleur état de conservation du PNB. Étant donné son exposition aux interventions humaines et sa faible superficie, celui-ci abrite en effet un nombre surprenant d'espèces "de forêt dense". Les espèces suivantes, toutes observées dans le PNB, sont considérées par Gartshore *et al.* (1995) comme "restreintes à la forêt naturelle avec peu ou pas d'influences anthropiques": *Stephanoaetus coronatus*, *Agapornis swindernianus*, *Alcedo leucogaster*, *Indicator maculatus*, *Campethera caroli*, *Pitta angolensis*, *Bleda eximius*, *Criniger olivaceus*, *Muscicapa olivascens*. Deux de ces espèces, *Pitta angolensis* et *Muscicapa olivascens*, seraient restreintes à la forêt primaire non exploitée; ces données montrent qu'ils s'adaptent également à la forêt secondaire âgée. *Tigriornis leucolopha*, *Accipiter melanoleucus*, *Indicator conirostris*, *I. willcocksi*, *Psalidoprocne nitens* et *Pholidornis rufiae*, cités par Gartshore *et al.* (1995), sont à exclure de cette liste; ces espèces sont en effet bien adaptables aux milieux dégradés (Gatter 1997, obs. pers.). *Urotriorchis macrourus*, *Cuculus clamosus*, *C. solitarius* et *Phoeniculus castaneiceps*

peuvent également être inclus dans cette catégorie; ils ont été régulièrement notés au PNB mais jamais en FCA. *C. clamosus*, très facilement repérable par son chant, pourrait être un bon indicateur de l'état de conservation de la forêt.

D'autres espèces existant dans les deux forêts sont nettement plus abondantes au PNB: c'est le cas de *Columba iriditorques*, *Apalis sharpii*, *Muscicapa ussheri*, *Lamprotornis cupreocauda* et *Ploceus albinucha*, ou dans une moindre mesure de *Trachyphonus purpuratus* et *Andropadus latirostris*.

A l'inverse, *Pogoniulus scolopaceus*, *Dendropicos pyrrhogaster*, *Andropadus gracilis*, *Bleda canicapillus* et *Hedydipna collaris*, bien qu'ils soient présents dans la forêt naturelle du PNB, sont nettement favorisés par les milieux dégradés de la FCA. D'autres espèces observées régulièrement en FCA ne se rencontrent au PNB qu'en forêt marécageuse (*Turtur tympanistria*, *Ceuthmochares aereus*, *Nicator chloris*, *Fraseria ocreata*) ou sur les lisières (*Andropadus virens*, *Camaroptera chloronota*, *C. superciliaris*, *Sylvietta virens*, *Chalcomitra adelberti*, *Cinnyris chloropygius*, *C. superbus*, *Ploceus nigricollis*) voire semblent totalement absentes du parc (*Bias musicus*, *Malimbus malimbicus*). Les habitats originels de ces espèces sont vraisemblablement les ouvertures en forêt (bords des rivières, trouées, grands chablis) ou bien la forêt marécageuse qui, comme les formations secondaires, a une canopée relativement ouverte, et un sous-bois dense et très riche en lianes.

Les espèces observées uniquement en FCA sont soit des espèces de clairières ou de forêt secondaire (par exemple *Bubulcus ibis*, *Buteo auguralis*, *Falco ardosiaecus*, *F. cuvieri*, *Francolinus achantensis*, *Spermestes fringilloides*), soit des espèces forestières qui existent certainement au PNB, bien que leur présence n'ait pu y être confirmée (par exemple *Eurystomus gularis*, *Apalis nigriceps*, *Nigrita fusconotus*).

Espèces menacées

Cinq espèces considérées comme globalement menacées ou quasi-menacées (BirdLife International 2004) ont été identifiées: au PNB *Bleda eximius* (Vulnérable VU, espèce à répartition restreinte RR), *Criniger olivaceus* (VU, RR), *Bycanistes cylindricus* (Quasi-menacé NT, RR), *Lamprotornis cupreocauda* (NT, RR) et peut-être *Melignomon eisenrauti* (Insuffisamment documentée DD); en FCA les deux dernières espèces. Parmi elles, seul *Lamprotornis cupreocauda* semble commun. Les quatre autres ont été signalées à une ou deux reprises seulement, bien que cela ne reflète probablement pas leur abondance réelle: trois d'entre elles sont discrètes et difficiles à observer, seul *Bycanistes cylindricus* a difficilement pu passer inaperçu. *Criniger olivaceus* pourrait n'être pas rare, au vu de son abondance en forêt de Yapo (Demey & Fishpool 1994, obs. pers.); de même pour *Melignomon eisenrauti*, signalée récemment de plusieurs autres localités ivoiriennes (Rainey *et al.* 2003). *Apalis sharpii*, espèce à répartition restreinte (RR) est abondante dans les deux forêts.

Avifaune des plantations forestières

Peu de données sont disponibles, concernant l'Afrique de l'Ouest, sur l'adaptation des

oiseaux aux plantations forestières. Seuls Gartshore *et al.* (1995) montrent que l'avifaune des plantations devient relativement riche à partir de 20 ans d'âge. En FCA, la plupart des espèces forestières colonisent les plantations lorsque les strates moyennes s'y sont reconstituées, avec des arbres autres que l'essence plantée atteignant 20–30 m, ce qui correspond à *c.* 20–25 ans d'âge.

La richesse ornithologique des plantations dépend également de l'essence plantée. Les plantations d'essences allochtones sont généralement pauvres, surtout pour les espèces qui ont un couvert dense ou se régénèrent trop abondamment pour permettre le développement d'autres arbres: les plantations d'*Acacia mangium*, *Agathis* et *Hopea* n'hébergent guère que les inévitables *Pycnonotus barbatus* et quelques autres espèces ubiquistes. Les vieilles plantations de pins sont plus riches car les lianes et arbustes s'y développent abondamment; elles attirent plutôt, parmi les oiseaux forestiers, des espèces du sous-bois et des strates moyennes, contrairement aux plantations d'*Eucalyptus* qui, ayant un sous-bois peu dense, sont surtout fréquentées par des espèces de canopée, notamment les souimangas qui visitent leurs fleurs. Les plantations les plus riches, cependant, sont de loin celles d'arbres indigènes, et particulièrement les plantations de *Khaya* âgées de 30 ans. Deux espèces menacées, *Melignomon eisentrauti* et *Lamprotornis cupreocauda*, ont été observées dans les plantations; elles y sont toutefois rares et rien ne garantit qu'elles puissent y survivre.

Outre les espèces de forêt dense citées plus haut, *Accipiter tachiro*, *Columba iriditorques*, *Coracina azurea*, *Phyllastrephus icterinus*, *Criniger barbatus*, *Apalis nigriceps* et *Muscicapa ussheri* n'ont jamais été observés dans les plantations (les espèces observées plus rarement ne sont pas mentionnées). Parmi les espèces peu adaptables (présentes uniquement dans les vieilles plantations d'essences indigènes, et y restant nettement plus rares qu'en forêt naturelle), on compte *Tauraco macrorhynchus*, *Apalis sharpii*, *Lamprotornis cupreocauda*, *Ploceus albinucha*, et dans une moindre mesure *Trachylaemus purpuratus*, *Andropadus ansorgei*, *A. latirostris*, *Ixonotus guttatus*, *Alethe diademata*, *Stizorhina finschi*, *Prionops caniceps* et *Cinnyris johannae*. Ces espèces pas ou peu adaptables sont principalement des frugivores ou de petits insectivores de la canopée, du fait de la rareté dans les plantations des arbres à fruits ou à feuilles fines du type *Piptadeniastrum*.

Des espèces comme *Chrysococcyx cupreus*, *Indicator conirostris*, *Tropicranus albocristatus*, *Andropadus gracilis*, *Calyptrorhynchus serina*, *Baeopogon indicator*, *Bleda canicapillus*, *Criniger calurus*, *Deleornis fraseri*, *Dryoscopus sabini*, *Oriolus brachyrhynchus* et *Malimbus nitens* s'adaptent bien aux vieilles plantations d'essences indigènes (c'est-à-dire que leur abondance y est voisine de celle en forêt naturelle), mais sont absentes des plus jeunes ou de celles d'arbres allochtones. Parmi les espèces adaptables aux plantations mêmes assez jeunes ou d'arbres allochtones, on peut citer *Chrysococcyx cupreus*, *Pogoniulus subsulphureus*, *Gymnobucco* spp., *Terpsiphone rufiventer*, *Dyaphorophya castanea* et *Cyanomitra olivacea*. Ce sont pour la plupart des espèces forestières banales.

D'autres espèces enfin, si elles existent en forêt naturelle, sont nettement

favorisées par les plantations, du moins par celles d'essences locales: c'est le cas d'*Andropodus gracilirostris*, *Camaroptera chloronota*, *Fraseria ocreata*, *Chalcomitra adelberti*, *Hedydipna collaris* et *Lamprotornis splendidus*. *Eremomela badiceps* est favorisé par les plantations de *Terminalia* mais absent des autres, même vieilles. Comme d'autres petits insectivores de la canopée (*Chalcomitra adelberti*, *Cinnyris johannae*), il montre une préférence distincte pour les deux arbres *Terminalia* et *Piptadeniastrum*.

Les plantations d'arbres forestiers, par la relative richesse de leur avifaune, présentent un intérêt certain, notamment en tant que "corridors écologiques" entre forêts: elles pourraient permettre des échanges entre populations aujourd'hui isolées du fait de la déforestation. Le morcellement de l'habitat est en effet l'un des principaux dangers qui menacent les espèces forestières ouest-africaines.

Conservation

Avec cinq espèces d'oiseaux menacées, cinq endémiques du bloc forestier de Haute-Guinée et 107 du biome des forêts guinéo-congolaises, l'ensemble PNB-FCA se qualifie comme IBA (Important Bird Area) selon les critères A1, A2 et A3 définis par Fishpool & Evans (2001).

Ces forêts comptent parmi les derniers vestiges de forêt psammohygrophile. Cette formation forestière, originellement restreinte à une frange lagunaire étroite dans l'est du pays, et qui compte plusieurs espèces végétales propres, a subi une régression spectaculaire suite au développement agricole et urbain de la région d'Abidjan: 86% des 93000 hectares couverts à l'origine par cette formation étaient détruits en 1990, le PNB représentant à lui seul 24% des 13000 ha restants (Lauginie *et al.* 1996). La surface de forêt psammohygrophile s'est encore beaucoup réduite depuis, ce qui renforce l'importance du parc pour la conservation de ce milieu.

La FCA est menacée à très court terme par la déforestation et l'extension urbaine de la ville d'Abidjan. Plus de la moitié des 5700 ha classés sont déjà occupés par des plantations industrielles d'hévéa. Le PNB, s'il n'est pas immédiatement menacé, l'est cependant à plus ou moins long terme: le braconnage y continue malgré la raréfaction du gibier, la récolte de produits dérivés est importante, la disparition des grands mammifères et notamment des éléphants entraîne des problèmes de régénération pour certains arbres (Lauginie *et al.* 1996), et surtout, la faible superficie du parc et son isolement ne permettent peut-être pas la survie de certaines espèces (*Stephanoaetus coronatus*, par exemple). Un projet de "corridor écologique" serait souhaitable, qui inclurait, outre le PNB et la FCA, la station de recherche d'Adiopodoumé (ex-station de l'ORSTOM, appartenant actuellement au Centre National de Recherches Agronomiques), et la Forêt Classée d'Audouin, située sur le cordon littoral. Cette forêt semble en bon état de conservation et abriterait encore des Chimpanzés. Une part importante de sa surface est occupée par des forêts marécageuses, ce qui en fait un site potentiel pour *Scotopelia ussheri*.

Remerciements

Je tiens à remercier Vincent Béligné, ancien président de l'association Côte d'Ivoire Nature, qui m'a fait découvrir ces deux forêts et m'a fourni une importante documentation sur le PNB. Bruno Boedts, Ron Demey, Hugo Rainey et Nathalie Armandy m'ont confié leurs observations personnelles; ils m'ont également accompagné sur le terrain, de même que beaucoup d'autres, ornithologues ou non, que je remercie eux aussi: Nonny Bamba, Hilaire Yaokokore Beibro, Annie et Patrick Brun, Claire Lamarque, Françoise et Michel Marquis, Philippe et Marie-Claire Métral, Wilma Wolthuis. Paul Yapou, guide du PNB, m'a renseigné sur la présence de certaines espèces d'oiseaux. Je suis également reconnaissant à Ron Demey, Robert Dowsett et Françoise Dowsett-Lemaire, que ont revu l'article; à Nik Borrow, Lincoln Fishpool, Tommy Pedersen et Volker Salewski pour leurs conseils, ainsi qu'à Jean Maley et Léandre Karamoko qui m'ont prêté des documents.

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Bird diversity in Nyassang Forest Park, The Gambia

by Stephanie Ballantyne

Graeme Kerr Building, University of Glasgow, Glasgow G12 8QQ, Scotland
<0204039b@student.gla.ac.uk>

Received 14 March 2006; revised 7 July 2006.

Summary

The bird diversity of Nyassang Forest Park on the River Gambia has not previously been studied. I report 113 bird species in the park in Jul–Aug 2005, and predict the forest's maximum wet season bird diversity to be 300 species. Out of five habitats studied, forest canopy contained the most bird species, and a cultivated rice field the fewest.

Résumé

Diversité des oiseaux dans le Parc de la Forêt de Nyassang, La Gambie. La diversité des oiseaux dans le Parc de la Forêt de Nyassang sur le fleuve Gambie n'avait pas encore été étudiée. J'y ai noté 113 espèces en juillet–août 2005 et prédis un maximum de 300 espèces pour la forêt en saison humide. Sur les cinq habitats étudiés, c'est la canopée forestière qui a le plus d'espèces et la rizière cultivée le moins.

Introduction

Nyassang Forest Park (13°38'30''N, 14°59'40''W), is situated in the Central River Division of The Gambia, covering c. 2500 ha. It lies on the mainland opposite the River Gambia National Park (RGNP), which was founded in 1977 to rehabilitate and conserve chimpanzees *Pan troglodytes* on its Baboon Islands. However, little is known about the wildlife of Nyassang. This paper presents the first published bird survey of Nyassang Forest Park, based on observations in the wet season, Jul–Aug 2005, and examines bird diversity in different habitats. The results are used to predict maximum wet season bird diversity for each habitat.

Study areas

Five habitats were studied: a used rice field (currently in cultivation), a disused (formerly cultivated) rice field, open water (the River Gambia), a waterside habitat

and the canopy of tertiary forest, defined as forest in its third successive generation after felling of primary and secondary forest.

The used rice field, of *c.* 3 ha, consisted of paddies separated by small mud walls. Some of the paddies had recently been cultivated and did not have long grass sprouting from the water within the paddy. Some of the cultivated paddies contained lily-pads. The muddy water in each paddy was *c.* 1 m deep. Some areas of the field had grass approximately 2.5 m tall. At cross-sections of the walls stood viewing huts which, as well as 3 m tall sticks projecting from some of the paddies, were used by birds as perching posts. Hay was strewn at muddy wall cross points. One palm was located in the field. Tertiary forest surrounded the field.

The disused rice field (*c.* 3.5 ha) had uniform short grass except for some areas of taller grass (> 2.5 m), standing water, and a line of sparse trees of various species in the centre. No mud walls separated individual paddies, so the field could only be viewed from its periphery. Tertiary forest surrounded the tear-drop shaped field.

The open water habitat consisted of a section (< 1 km) of the River Gambia, which flows between Island 2 of Baboon Islands and the mainland. The river was tidal. Vegetation hung over the river edge.

Waterside was a zone up to 30 m from the River Gambia, and included a narrow 394 m trail that meandered parallel to the river, *c.* 3–8 m from it, and in places was on a slope. Beyond the track, the slope rose *c.* 6 m. Small areas of the slope were covered in long grass. Beyond the track and grass, the area was backed by thick mixed vegetation.

The tertiary forest canopy surrounded the Forest Park camp and stretched from camp *c.* 1 km to the disused rice field and 766 m to the used rice field. It consisted of thick diverse vegetation, with a canopy height noticeably less than that of the primary forest on Baboon Islands opposite.

Methods

The MacKinnon List technique (Bibby *et al* 1998) was used to record bird species in relation to habitat. Five different points within each habitat were noted on sketched maps, (six points on the waterside, and four points for the open water due to the wide view). Points were chosen for accessibility and good views. The forest canopy was viewed from five platforms constructed on a hill above the canopy. A list of the first eight different bird species seen or heard was made while sitting at a point, then the list was stopped. In the waterside habitat, the view was restricted by trees, so a 15 m radius was estimated around a point, within which the observer could move to get better views. The date, habitat and point were recorded for each list completed. The record of which habitats and points had been recently used was checked before each new day, and the habitats and vantage points that had the fewest lists completed were chosen to do that day.

Lists were completed in the morning (6h30–12h00), afternoon (12h00–16h30) and dusk (16h30–18h00). Usually at least three lists were completed in a day, one in each of

the three periods, usually in different habitats, but often time would allow more lists to be completed. Over a six week period (Jul–Aug), 16 lists were completed in each habitat.

For used and disused rice fields, birds heard or seen within the field, at the edge and flying over the fields were included. Open water included birds seen flying over the river or at the water’s edge, but birds heard in the overhanging forest canopy were not noted. In waterside, birds heard or seen on the river were excluded but birds perching on trees over-hanging the river were included, as were birds flying into or over the waterside habitat. Tertiary forest canopy included birds flying over or in the canopy but birds flying along the river next to the canopy were not noted. Birds were identified using Barlow *et al.* (1999) and Barlow (2002).

To predict maximum wet season bird species for each habitat, an antilog graph was produced for each habitat from the MacKinnon lists (Bibby *et al* 1998). The graphs plot number of new species recorded for each list completed against log cumulative number of species for that habitat. A negative slope results and the intercept of the regression line with the x-axis is the predicted number of bird species for that habitat. The Minitab statistics program produced regression lines that did not cut the x-axis, therefore the lines were extrapolated.

From the MacKinnon lists a Relative Abundance Index (RAI) can be produced to examine which bird species are most abundant in which habitats (Bibby *et al.* 1998). The RAI is the proportion of the lists completed in which the species occurs. However, rather than dividing by total number of lists to give maximum RAI of 1, as the number of lists in all habitats was the same (16 in each) I simply use number of lists recorded as RAI. An RAI of 16 therefore indicates that a species was recorded in all 16 lists, and a score of 1 indicates that a species was noted only once in a habitat.

Results

The tertiary forest canopy had the highest observed and predicted bird diversity and the used rice field the lowest (Table 1). The whole park has a predicted bird diversity of 300 species, more than double the 113 observed.

Table 1. Observed (Jul–Aug 2005) and predicted Jul–Aug bird diversity for habitats in Nyassang.

	Observed bird species	Predicted wet season bird diversity
Tertiary forest canopy	56	110
Disused rice field	51	90
Open water	43	61
Waterside	38	50
Used rice field	34	43
Nyassang all habitats	113	300

Observed species are listed in Table 2. In the tertiary forest, Yellow-crowned Gonolek, Broad-billed Roller, Western Grey Plantain-eater, Red-billed Hornbill and Mourning Dove had the highest RAI and 31 species were noted only once. In the waterside habitat, Vinaceous Dove, Long-tailed Glossy Starling and Yellow-crowned Gonolek had the highest RAI, and 18 species noted only once. In the open water habitat, Mourning Dove, Rose-ringed Parakeet and Long-tailed Glossy Starling had the highest RAI, while 19 species were noted only once. In the used rice field, African Jacana, Village Weaver, Squacco Heron and Striated Heron were the most abundant birds, while 17 species were noted only once. In the disused rice field, Vinaceous Dove, Yellow-crowned Bishop, African Jacana and Mourning Dove had the highest RAI, with 29 species noted only once.

Table 2. Species list for Nyassang, with Relative Abundance Index values (range 0–16) for the study period. Species that were observed only when not recording lists are marked X in the relevant habitat column(s) and NH where the species was seen in the Park but habitat not noted.

	UR	DR	OW	WS	TF
Phalacrocoracidae					
<i>Phalacrocorax africanus</i> Long-tailed Cormorant		2	2		
Anhingidae					
<i>Anhinga rufa</i> African Darter	2	3	5	1	
Ardeidae					
<i>Nycticorax nycticorax</i> Black-crowned Night Heron	1				
<i>Ardeola ralloides</i> Squacco Heron	15	4	6		2
<i>Bubulcus ibis</i> Cattle Egret		2	3		
<i>Butorides striatus</i> Striated Heron	12	1	5	1	
<i>Egretta ardesiaca</i> Black Egret			2		
<i>E. garzetta</i> Little Egret	1	2			2
<i>E. intermedia</i> Intermediate Egret	3	1	3		1
<i>E. alba</i> Great Egret	7		7	1	
<i>Ardea purpurea</i> Purple Heron	1	1			
<i>A. cinerea</i> Grey Heron		1			
<i>A. melanocephala</i> Black-headed Heron	1				
Threskiornithidae					
<i>Plegadis falcinellus</i> Glossy Ibis					1
<i>Bostrychia hagedash</i> Hadada	1	1	4		1
<i>Threskiornis aethiopicus</i> Sacred Ibis (NH)					
Anatidae					
<i>Dendrocygna viduata</i> White-faced Whistling Duck	3				
<i>Plectropterus gambiensis</i> Spur-winged Goose		1	1		
<i>Nettapus auritus</i> African Pygmy Goose	1				

	UR	DR	OW	WS	TF
Accipitridae					
<i>Milvus migrans</i> Black Kite					2
<i>Haliaeetus vocifer</i> River Eagle			1		
<i>Gypohierax angolensis</i> Palm-nut Vulture	2	2	3	1	2
<i>Necrosyrtes monachus</i> Hooded Vulture (NH)					
<i>Gyps africanus</i> White-backed Vulture					1
<i>Circaetus gallicus</i> Brown Snake-Eagle			X		
<i>Aquila wahlbergi</i> Wahlberg's Eagle					1
<i>Lophaetus occipitalis</i> Long-crested Eagle		2	1		
Phasianidae					
<i>Ptilopachus petrosus</i> Stone Partridge				X	
Rallidae					
<i>Amaurornis flavirostris</i> Black Crane		1			
Heliornithidae					
<i>Podica senegalensis</i> African Finfoot			X		
Jacaniidae					
<i>Actophilornis africanus</i> African Jacana	16	13			
Columbidae					
<i>Treron waalia</i> Bruce's Green Pigeon			X		
<i>Turtur tympanistria</i> Tambourine Dove		1			
<i>T. afer</i> Blue-spotted Wood Dove		1	1		
<i>T. abyssinicus</i> Black-billed Wood Dove		2	1	1	
<i>Oena capensis</i> Namaqua Dove		1		1	1
<i>Streptopelia semitorquata</i> Red-eyed Dove	1	2	1		2
<i>S. decipiens</i> African Mourning Dove		9	12	8	6
<i>S. vinacea</i> Vinaceous Dove	3	14	3	13	3
<i>S. roseogrisea</i> African Collared Dove	X	X			
<i>S. senegalensis</i> Laughing Dove		1	2	1	
Psittacidae					
<i>Poicephalus senegalus</i> Senegal Parrot		1	2		2
<i>Psittacula krameri</i> Rose-ringed Parakeet	9	1	10	9	4
Musophagidae					
<i>Musophaga violacea</i> Violet Turaco		2			1
<i>Crinifer piscator</i> Western Grey Plantain-eater	1	3	5	3	7
Cuculidae					
<i>Oxylophus levaillantii</i> Levaillant's Cuckoo		1			
<i>Centropus grillii</i> Black Coucal	1		1		
<i>C. senegalensis</i> Senegal Coucal	3	3	2	3	1
Strigidae					
<i>Bubo lacteus</i> Verreaux's Eagle Owl					X
<i>Glaucidium perlatum</i> Pearl-spotted Owlet					1

	UR	DR	OW	WS	TF
Apodidae					
<i>Cypsiurus parvus</i> African Palm Swift (NH)					
<i>Apus affinis</i> Little Swift	1				
Alcedinidae					
<i>Halcyon leucocephala</i> Grey-headed Kingfisher					2
<i>H. malimbica</i> Blue-breasted Kingfisher	1			3	1
<i>H. senegalensis</i> Woodland Kingfisher		1			1
<i>Ceyx picta</i> African Pygmy Kingfisher	1	1		1	1
<i>Corythornis cristata</i> Malachite Kingfisher	1	1			
<i>Ceryle rudis</i> Pied Kingfisher			1		1
Meropidae					
<i>Merops hirundineus</i> Swallow-tailed Bee-eater					1
Coraciidae					
<i>Eurystomus glaucurus</i> Broad-billed Roller	5	3	2	5	10
Phoeniculidae					
<i>Phoeniculus purpureus</i> Green Wood-hoopoe				1	
<i>P. aterrimus</i> Black Wood-hoopoe		1	1	1	3
Bucerotidae					
<i>Tockus erythrorhynchus</i> Red-billed Hornbill	3	3	1	2	6
Capitonidae					
<i>Lybius dubius</i> Bearded Barbet					2
Indicatoridae					
<i>Indicator indicator</i> Greater Honeyguide				1	
Picidae					
<i>Campethera punctuligera</i> Fine-spotted Woodpecker				1	
<i>Dendropicos goertae</i> Grey Woodpecker				X	
Hirundinidae					
<i>Hirundo senegalensis</i> Mosque Swallow					1
Oriolidae					
<i>Oriolus auratus</i> African Golden Oriole			1		1
Campephagidae					
<i>Coracina phoenicea</i> Red-shouldered Cuckoo-shrike				2	
Dicruridae					
<i>Dicrurus adsimilis</i> Fork-tailed Drongo					1
Pycnonotidae					
<i>Chlorocichla flavicollis</i> Yellow-throated Leaflove (NH)					
<i>Pyrrhurus scandens</i> Leaflove			1		
<i>Turdoides reinwardtii</i> Blackcap Babbler			1	3	1
<i>Pycnonotus barbatus</i> Common Bulbul	1		1	2	2
Turdidae					
<i>Cossypha niveicapilla</i> Snowy-crowned Robin-Chat				7	2

	UR	DR	OW	WS	TF
<i>C. albicapilla</i> White-crowned Robin-Chat				X	
Sylviidae					
<i>Apalis flavida</i> Yellow-breasted Apalis			1		1
<i>Camaroptera brachyura</i> Grey-backed Camaroptera					1
Zosteropidae					
<i>Zosterops senegalensis</i> Yellow White-eye (NH)					
Muscicapidae					
<i>Melaenornis edolioides</i> Northern Black Flycatcher		1		2	3
<i>Bradornis pallidus</i> Pale Flycatcher		1	1		
<i>Muscicapa aquatica</i> Swamp Flycatcher		1	1		
<i>Ficedula hypoleuca</i> Pied Flycatcher		1			
Monarchidae					
<i>Terpsiphone rufiventer</i> African Paradise Flycatcher		1			
Platysteiridae					
<i>Platysteira cyanea</i> Common Wattle-eye			2	9	5
Nectariniidae					
<i>Chalcomitra senegalensis</i> Scarlet-chested Sunbird				1	
<i>Hedydipna platura</i> Pygmy Sunbird					1
<i>Cinnyris chloropygia</i> Olive-bellied Sunbird					1
<i>C. pulchella</i> Beautiful Sunbird				1	
<i>C. venusta</i> Variable Sunbird		1			
Malaconotidae					
<i>Malaconotus blanchoti</i> Grey-headed Bush-Shrike (NH)					
<i>Dryoscopus gambensis</i> Northern Puffback				2	1
<i>Laniarius barbarus</i> Yellow-crowned Gonolek		4	3	10	12
Sturnidae					
<i>Lamprotonis purpureus</i> Purple Glossy Starling	1				2
<i>L. chalcurus</i> Bronze-tailed Glossy Starling (NH)					
<i>L. chalybaeus</i> Greater Blue-eared Glossy Starling	1			1	1
<i>L. caudatus</i> Long-tailed Glossy Starling	4	6	8	11	5
Passeridae					
<i>Passer griseus</i> Grey-headed Sparrow				1	1
Ploceidae					
<i>Ploceus cucullatus</i> Village Weaver	15	2	7	3	5
<i>P. melanocephalus</i> Yellow-backed Weaver	1		7	8	1
<i>Quelea erythrops</i> Red-headed Quelea					1
<i>Euplotes franciscanus</i> Northern Red Bishop		1			
<i>E. hordeaceus</i> Black-winged Red Bishop					1
<i>E. afer</i> Yellow-crowned Bishop	6	13	1		1
<i>E. macroura</i> Yellow-mantled Widowbird		1			3

	UR	DR	OW	WS	TF
Estrildidae					
<i>Estrilda caerulescens</i> Lavender Waxbill		1			2
<i>Uraeginthus bengalus</i> Red-cheeked Cordon Bleu				1	1
<i>Lagonosticta rufopicta</i> Bar-breasted Firefinch		1			
<i>L. senegala</i> Red-billed Firefinch		2	1	4	1
<i>Euodice cantans</i> African Silverbill		1			
Viduidae					
<i>Vidua wilsoni</i> Wilson's Indigobird				X	
<i>V. chalybeata</i> Village Indigobird	2			1	

Discussion

In total, 113 bird species were noted in Nyassang Forest Park during a six-week period in the wet season. The total predicted bird diversity for the park was 300 species. The true total will certainly be much greater than 113, because birds were only recorded in the wet season, and nocturnal surveying could not be carried out. The Gambia has been reported to have around 540 bird species (Barlow *et al.* 1999), and approximately one fifth of this total was noted in the Nyassang Forest Park, which is outstanding for a small forest park, perhaps in part because public access is restricted. The prediction of the maximum wet season bird diversity (300) seems quite high (over half of The Gambia's entire avifauna) and further work should be done to refine this estimate. None of the species recorded in Nyassang is regarded as globally threatened (Hilton-Taylor 2000), but the rare African Finfoot was observed.

The habitat with the highest bird diversity and the highest predicted bird richness was, as expected, the tertiary forest canopy, probably because it had more useful tree species, including such sources of food for frugivorous birds as Boabab *Adansonia digitata*, Tabo *Cola cordifolia*, Keno *Pterocarpus erinaceus* and *Bombax ceiba*. Also, the canopy is directly opposite and < 20 m from Island 2 of Baboon Islands which contains primary forest. The other habitats (except waterside and open water) do not have the primary forest close to them.

The disused rice field had the second highest observed and predicted bird diversity, which gives hope that other disturbed areas may revert to diverse areas. One possible reason it had such a high diversity may be that it was surrounded by tertiary forest, which allowed birds to visit the old paddies to bathe or hunt. Many trees overhanging the field edge contained small birds such as African Paradise Flycatcher and estrildids. The sparse trees in the middle were popular with birds of prey like the Long-crested Eagle, and thereby increased its diversity. The unchecked growth of the grass and reeds also contributed to the high diversity, as the tall grasses in the middle were popular with Yellow-crowned Bishop and Swamp Flycatcher.

Open water had the third highest bird diversity, with the peripheral trees overhanging the river contributing to this. The waterside habitat had the second lowest bird biodiversity, but this may have been an artefact because recording birds was more difficult there than in other habitats. The used rice field had the lowest observed and predicted bird diversity, probably because cultivation reduces vegetation diversity and human presence deters birds. Unlike the disused rice field, there were no trees in the middle to attract birds of prey.

Many birds which were most abundant in one habitat were also most abundant in others, e.g. Yellow-crowned Gonolek in tertiary forest canopy and waterside. The African Jacana was the most abundant bird in the used rice field and the second most abundant in the disused rice field. Thus, if one habitat is developed or fragmented then such birds may be able to survive in other undeveloped areas. Conversely, many species were only recorded once or in one habitat. Plans for ecotourism development could prejudice these rarer species, although the planned exclusive tourism will cause relatively low disturbance while providing income to help sustain Nyassang and RGNP.

Acknowledgments

I thank the members of the University of Glasgow Gambia 2005 Expedition team, especially Rory Crawford, Eilidh Spence and Martin Muir, for help with bird surveying and write-up, David and Stella Marsden and all the park rangers for helpful information, especially Alieu who guided me through the park. Funding was provided by the Explorers Club (New York), the Royal Geographical Society, the University of Glasgow, the Carnegie Trust and the People's Trust for Endangered Species. I would also like to thank Dr Stewart White for his advice with the project and Dr Reudi Nager for checking the paper.

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News & Letters — Nouvelles & Lettres

W.A.O.S. Research Grant project report: the Congo Peafowl *Afropavo congensis* in Salonga National Park (Democratic Republic of Congo)

Field work for this project, at Lokofa (1°41.5'S, 20°34.4E; alt. 361 m) and Ikolo (1°16.2'S, 20°49.8'E; alt. 353 m) in the Salonga NP and its surroundings was undertaken from June 2004 to November 2005, to examine the population density, habitat characteristics, feeding ecology and main threats of the Congo Peafowl *Afropavo congensis*.

At Lokofa, the study area consisted of 2 km² of undisturbed primary forest (UPF) and 2 km² of old-growth secondary forests (OSF). At Ikolo, the whole study area (4 km²) lies within an UPF. Distance Sampling and acoustic sampling were used for population density estimation. Two transect lines per study area were chosen at random each month and walked with a velocity of approximately 1 kmh⁻¹. Birds were noted together with their distance from the observer, height and vision angle. The acoustic sampling technique was used at night to record the number of adult cries from 18h00 to 6h00 at points on transect lines.

The microhabitat of the species was characterised using data on vegetation, topography, indices of perturbation, distances to a watercourse or to human dwellings, from sites where individuals were sighted or droppings or feathers collected. Droppings collected in the field, and crop and gizzard of killed individuals collected in villages, were analysed in the laboratory. Information on diet was collected from hunters questioned. An inquiry was made on the number and sex of peafowls killed yearly, in villages surrounding the park. People were also questioned on the trap types used and other types of threats which the birds face.

In total, 31 Congo Peafowls have been observed, 28 individuals at Lokofa and 3 at Ikolo. Males (46%) were sighted at Lokofa more than females (39%) and young (14%). Sixty-seven cries have been recorded at Lokofa and 41 at Ikolo, totalling 108 recorded cries during 432 and 288 hours respectively.

If habitat use is reflected by the frequency of sightings, UPF would be the preferred habitat, but other indications (droppings, feathers and cries) of the species' presence are more frequent in the OSFs.

The diet of the Congo Peafowl includes fruits of *Allanblackia floribunda*, *Anonidium manni*, *Canarium schweinfurthii*, *Elaeis guineensis*, *Greenwayodendron suaveolens*, *Margaritaria* sp., *Microdesmis puberula*, *Klainedoxa gabonensis*, *Palisota* sp., *Strombosia* sp., *Treculia africana*, *Xylopia aethiopica*, and unidentified *Caesalpiniaceae*, *Euphorbiaceae*, *Rubiaceae* and other families, Coleoptera, Heteroptera, Odonata, Hymenoptera, Lepidoptera, Myriapoda, Isoptera, Mollusca, Acari, Aranea, Opiliones, Blattoidea, Orthoptera, Annelida and unidentified arthropods.

The number of hunters per village varies from one to 36. Sometimes all the men older than 14 years are hunters. In general, the yearly capture rate of Congo peafowl is about 20 animals per village. The most used capture technique is a wire snare, sometimes baited with palm nuts

Habitat loss and habitat degradation essentially caused by forest exploitation and agricultural activities, plus destruction of nests and collection of eggs, constitute other menaces for the Congo peafowl.

This project was supported by the British Ecological Society, the North of England Zoological Society, Idea Wild, the West African Ornithological Society and the World Pheasant Association.

M. Mulotwa¹, M. Louette, A. Dudu & A. Upoki

¹Université de Kisangani, Faculté des Sciences (Biologie),
Département d'Ecologie et Gestion des Ressources Animales et Végétales,
Laboratoire LEGERA, BP 2012, Kisangani, R.D. Congo. <emilemulotwa@yahoo.fr>

Reviews — Revues

The Birds of São Tomé and Príncipe with Annobón, islands of the Gulf of Guinea, by P. Jones & A. Tye, 2006. 172 + xix pp., 34 col. plates. Checklist 22, British Ornithologists' Union, Oxford. ISBN 0-907446-27-2, hardback, £30 (incl. postage) from <www.bou.org.uk>.

When beginning a study of the birds of a poorly known region, having a BOU checklist is an invaluable help. Thanks to the work of Peter Jones and Alan Tye, we now have available Checklist 22, for São Tomé, Príncipe and Annobón, islands of the Gulf of Guinea. These three islands plus Bioko and continental Mt Cameroon make up a volcanic archipelago along a SW–NE fracture in the earth's crust.

The book follows the format of the checklist series, beginning with interesting introductory chapters on climate, physical and human geography, and the avifauna (annual cycles, ecology, conservation etc.). It then details, species by species, each and every known piece of information regarding presence, reviewing the entire known bibliography and supplementing this with unpublished data. This is without doubt a luxury for those who may have the opportunity to study the birds of these islands.

São Tomé, Príncipe and Annobón have been included by BirdLife as Endemic Bird Areas (EBAs) and as Important Bird Areas (IBAs). Despite their total area amounting to only a little more than 1000 km² (scarcely 35 x 35 km), the three islands possess more than 70 landbird species, including four endemic genera, 18 endemic species and 13 additional endemic subspecies. To these high endemism figures can be added the importance of the seabird populations which breed on their cliffs and islets.

The three islands were uninhabited when discovered by Portuguese navigators, and the story of their birds curiously approaching the first observers to land on the islands now seems fabulous. Five centuries later, the vegetation has been radically transformed, above all into cocoa plantations, and the human population density has become among the highest in Africa.

This new work by Jones and Tye complements the field guide by Patrice Christy and W.V. Clarke (1998, *Guide des Oiseaux de São Tomé e Príncipe*, ECOFAC), and results in the avifauna of the Gulf of Guinea becoming among the best known in Africa. However, whoever may have the good fortune to visit the islands, will almost certainly still be able to uncover many unknown facts about the status and biology of their spectacular birds.

Jaime Pérez del Val

The Bird Atlas of Uganda, by M. Carswell, D. Pomeroy, J. Reynolds & H. Tushabe, 2005. 553 + xi pp., numerous maps. British Ornithologists' Club, Oxford. ISBN 0-9522866-4-8, hardback, £55 from <www.bou.org.uk>.

Uganda abuts the W.A.O.S. area of interest and many characteristically W African birds reach their easternmost limit in its western forests, which lie longitudinally between the Democratic Republic of Congo and Rwanda. These represent the easternmost extent of the W African forest block. This atlas is thus of great interest to W African ornithologists.

Introductory sections cover Uganda's landforms, past and present climate, seasonality, ecological zones and habitats, human impact, ornithological history, an avifaunal review, conservation, and a review of atlas methods and of those used in the present one.

This atlas is based on published and contributed records, with few field trips carried out specifically for the project. Data up to the end of 1999 are included, with an Appendix giving details of additional species accepted since then. An innovation is the use of modelling to predict species distributions: important in a country with such patchy ornithological coverage as Uganda. Quarter-square degrees (of side 0.5°) are used for pre-1990 records and for any post-1990 ones without coordinates; points are used for post-1990 georeferenced records. Breeding records are not mapped (too few), but are included in the species texts. The georeferenced records are used to predict distributions with reference to environmental variables. Of six variables assessed, rainfall and vegetation gave the most successful combination, as tested on a range of species with quite well-known distributions. Maps are given for all species with at least five records, and distributions predicted for all with at least 10 point records, excepting waterbirds.

The predicted distributions seem best for species that have clear habitat preferences (*e.g.* forest or montane birds) or have restricted geographical ranges (*e.g.* only in the NE). They are least convincing (or useful?) for common mobile species such as raptors and swallows. Like all atlases, the main use of this one will be as a baseline for recording new information and for future documentation of change. It will be an essential reference for those working on Uganda's birds for years to come.

Alan Tye

Society Notices — Informations de la Société

Full text of *Malimbus* Volumes 1–24 on the website

As announced in the last issue, work was then under way to achieve Council's aim of putting the entire contents of *Malimbus* (except the most recent three years) on the website (<http://malimbus.free.fr>). This has now been done for volumes 1–24. Before the end of 2006, we expect to add Volume 25 to this archive, and a new volume each year thereafter.

All issues are available as pdf files, based on scanned images of pages. The cost to the Society of the scanning was about £375. Future volumes will not need to be scanned, because pdf files of the contents will be made from the files used by the Editor to compile the issue. The scanning was done at 200 dpi using monochrome, 1-bit setting, which produced the smallest easily-readable pdf files, resulting in the shortest download times, to speed up access from slow internet connections. Files are available in three different formats: pages, articles and issues.

Pages. Files of 2924 individual *Malimbus* pages are available, allowing easy viewing of all pages referencing a particular species, with the help of the accompanying index of 1190 taxa. They are also handy for reading short notes, book reviews, notices, letters and corrigenda using the adjacent detailed tables of contents and country indicators, or just for browsing.

Articles. Files of 193 *Malimbus* scientific articles (three pages or more in length) are online. For shorter pieces, use the individual page method.

Issues. Files of 46 *Malimbus* issues are on the site. Normally there have been two issues per volume, though only one in volumes 6 and 24.

Please let me know of any problems encountered in using these new features.

Peter Browne
Webmaster <pbrowne@cyberus.ca>

Texte complet des volumes de *Malimbus* 1–24 sur le site web

Comme annoncé dans le précédent numéro, un travail était alors en cours pour réaliser le projet du Conseil de SOOA, de mettre tout le contenu de *Malimbus* (sauf les trois dernières années) sur le site (<http://malimbus.free.fr>). C'est désormais réalisé pour les Volumes 1–24. Avant la fin de 2006, nous espérons ajouter à ces archives le Volume 25, et par la suite un nouveau volume chaque année.

Tous les numéros sont disponibles comme dossiers pdf basés sur des images des pages numérisées. Pour la Société le coût de la numérisation s'est élevé à environ £375£ (environ €560). Les prochains numéros n'auront pas à être numérisés, parce

que les fichiers pdf de leur contenu seront construits à partir des fichiers utilisés par le Rédacteur pour composer le numéro. La numérisation a été réalisée en 200 points/pouce en noir et blanc, 1-bit, ce qui a produit les plus petits fichiers pdf facilement lisibles, avec un temps minimal de téléchargement, pour accélérer ainsi l'accès des connections internet lentes. Les dossiers sont disponibles en trois formats différents: pages, articles et numéros.

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Veuillez m'informer de toute difficulté rencontrée en utilisant ces nouvelles fonctionnalités.

Peter Browne

Webmestre <pbrowne@cyberus.ca>

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GIANNOTTI, A., Hall 8, 4 Rue de Firmin Gernier, F-75018, Paris, **France**

HORÁK, D., Dept of Zoology, Faculty of Sciences, Charles University, Viničná 7, CZ-128.44 Praha, **Czech Republic**

KLOP, E., Thorbeckstr. 160, 6702 BW Wageningen, **Netherlands**

LAZELL, D., Appletree Cottage, Walsingham Rd., Burnham Thorpe PC31 8HN, **U.K.**

WATSON, P., 24 Woodlands Rd., Hassocks, W Sussex BN6 8HG, **U.K.**

PEREGRINE FUND, 5668 West Flying Hawk Lane, Boise, Idaho 93709, **U.S.A.**

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VOGELWARTE RADOLFZELL

Name and address changes and corrections

BULENS, P. [not J.], Hougaillard, 47170 Reaup-Lisse, **France**

HANDKE, C., Brusselsstr. 25, D-13353 Berlin, **Germany**

LACHENAUD, C., 1070 Av. des Fes, 34080 Montpellier, **France**

MANIRE, K., BP 3194, Lomé, **Togo**

MANVELL, A., 941 Chemin de Fourtrouse, 84200 Carpentras, **France**

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Editor's Report for the years 2003–5

Since achieving in 1996 a standard publication schedule (March and September) for the two issues per year, the flow of manuscripts was sufficient to maintain this schedule for five years. However, there was a three-month delay in the second issue of 2001, and enough material for only a single issue in 2002, both due to shortage of material. During the period covered by the present report, the flow of manuscripts was still low until 2004, when a single issue only was produced during the year. Since then, the situation has improved and two issues were printed in 2005. Statistics for 2003–5 are summarized in Table 1.

Since Volume 1, the average number of pages per volume has been 119. Since the last report, the decline in submissions has reversed, with full-length papers making up most of the increase. It was a lack of full-length papers that contributed most to the previous decline in material. Encouragingly, more biological and ecological submissions have recently been received and published.

Table 1. *Malimbus* publication statistics, 2003–5.

	2003	2004	2005
Number of pages	116	48	124
Scientific papers received	16	18	19
published	20	10	15
rejected	1 (6%)	1 (6%)	1 (5%)
Reviews published	5	2	1
News & Letters (including Corrigenda) published	1	2	1
Society Notices published	5	2	6

All full-length papers and Short Notes were reviewed by two (occasionally one or three) referees, in addition to the Editor. Referees are acknowledged in each issue as the "Editorial Board".

Three papers were rejected due to inadequate methodology (one) and/or lack of new data (three). The proportion rejected, of those received the same year, was back to the norm of previous years (usually 0–10%), following a higher rejection rate (20–25%) in 2001–2, but this was not caused by any change in the standards for acceptance. Rejection took place within at most nine months of receipt. Of the 45 scientific papers published, 36 (80%) required revision by their authors (beyond minor editorial changes). After receiving referees' comments, the time taken by authors to revise their papers varied from same day return to 15 months (median one month), similar to recent years. The delay between receiving a final acceptable version of a paper and its publication was one week to 14 months (median 5 months), similar to recent previous years and difficult to reduce further, given our 6-monthly publication schedule; the longer delays were associated with years when only one number was issued. Altogether, including the time taken for review by referees, editing by me and proof-reading by authors, the delay between first receipt of a submission and its publication varied from two to 24 months (median 10 months), with 76% of papers published within one year of receipt, an improvement over the recent average.

No Index had been published since that to Volume 17 (1995), until R.J. Dowsett provided an Index to Vols 18–25 (1996–2003), which was published in 2005 and placed on the web site. The intention is to update the web-based index annually from now on, and I thank Bob Dowsett for this work.

I should once again like to express my thanks to all referees for their precious time and valuable insights, as well as to Peter Browne, Geoffrey Field, Gérard Morel, Bob Sharland, Hazell Thompson and Roger Wilkinson for their contributions to managing the journal's printing, distribution and mailing list, and placing copy quickly on the web site.

Alan Tye

Rapport du Rédacteur pour la période 2003–5

Depuis l'instauration en 1996 d'un rythme normal de deux publications par an (mars et septembre), l'arrivée des manuscrits avait suffi à maintenir cette cadence pendant cinq ans. Il y avait cependant eu un retard de trois mois pour le deuxième numéro de 2001, et juste assez de texte pour une seule livraison en 2002, ces deux faits étant dus à la pénurie de soumissions. Pendant le période du présent rapport, l'arrivée des manuscrits continua d'être médiocre jusque 2004, année où ne parut qu'une seule livraison. Depuis lors, la situation s'est améliorée avec la parution de deux numéros en 2005. Les statistiques pour les années 2003–5 sont résumées dans le Tableau 1.

Table 1. Statistiques des publications pour 2003–5.

	2003	2004	2005
Nombre de pages	116	48	124
Articles scientifiques reçus	16	18	19
publiés	20	10	15
refusés	1 (6%)	1 (6%)	1 (5%)
Revue de livres publiées	5	2	1
Nouvelles & Lettres publiées (Errata inclus)	1	2	1
Nouvelles de la Société publiées	5	2	6

Depuis le volume 1, le nombre moyen de pages par volume a été de 119. Depuis le rapport antérieur, le déclin du nombre des manuscrits reçus s’est arrêté avec la réception de plus de longs articles. C’était le manque de longs articles qui avait contribué essentiellement au déclin antérieur. Il est encourageant de recevoir et de publier maintenant davantage de manuscrits sur la biologie et l’écologie.

Tous les longs manuscrits et les Notes Courtes ont été revus par deux (parfois un ou trois) lecteurs en plus du Rédacteur. Les lecteurs sont cités dans chaque numéro à la rubrique Comité de Rédaction.

Trois articles furent refusés pour méthodologie inappropriée (un) et/ou par manque de données nouvelles (trois). La proportion de manuscrits refusés par rapport à ceux reçus la même année a retourné à celle des années précédentes (habituellement 0–10%), après un taux de rejet plus élevé (20–25%) pendant le période 2001–2; ce n’était pas dû à quelque modification des critères d’acceptation. Le refus eut lieu tout au plus dans les neuf mois suivant la soumission. Sur les 45 articles scientifiques publiés, 36 (80%) exigèrent une révision par leurs auteurs (en plus de changements mineurs de la rédaction). Après avoir reçu les remarques des critiques, la révision faite par les auteurs allait du retour le jour même jusqu’à 15 mois (moyenne un mois), semblable à celle des dernières années. Le délai entre la réception de la version définitive d’un manuscrit et sa publication fut d’une semaine à 14 mois (moyenne 5 mois), donc semblable à celui des années précédentes et difficile à réduire, étant donné notre rythme de parution bisannuel. Les délais les plus longs s’associaient aux ans où ne paraissait qu’un seul numéro. Au total, le temps pris par les critiques, mes propres corrections et les lectures d’épreuves par les différents auteurs, le délai entre la première réception d’un manuscrit et sa publication a varié entre deux et 24 mois (moyenne 10 mois), 76% des articles étant publiés dans les 12 mois de leur réception, signe d’une amélioration sur la dernière moyenne.

Il n’y eut aucune publication d’Index depuis celle du volume 17 (1995), jusqu’à celle préparée par R.J. Dowsett pour les volumes 18–25 (1996–2003), qui parut en 2005 et figure sur la toile web. C’est notre intention de remettre à jour chaque année cet index basée sur la toile dès maintenant, et je remercie Bob Dowsett pour ce travail.

Je tiens de nouveau à remercier tous les critiques pour le temps et les avis qu'ils ont généreusement données, et Peter Browne, Geoffrey Field, Gérard Morel, Bob Sharland, Hazell Thompson et Roger Wilkinson qui ont contribué à l'impression du journal, à sa distribution et à établir la liste des abonnés, ainsi qu'à la saisie rapide sur la toile.

Alan Tye

Instructions aux Auteurs

Malimbus publie des Articles, des Notes Courtes, des Revues de Publications et des Nouvelles & Lettres traitant de l'ornithologie ouest-africaine.

Les **Articles** et les **Notes Courtes** doivent être des apports originaux; ceux déjà publiés ailleurs, en partie ou en totalité, seront normalement refusés. Les Notes Courtes sont des articles de moins de 1500 mots (références comprises) ou de trois pages imprimées. Autant que possible, les manuscrits auront été auparavant soumis au moins à un ornithologue ou biologiste pour un examen minutieux. Les manuscrits seront envoyés pour critique à au moins un lecteur compétent.

Les textes des **Nouvelles & Lettres** ne devraient dépasser 1000 mots.

Les **textes** sont acceptés en anglais et en français; la Rédaction pourra aider les auteurs dont la langue maternelle n'est pas l'une de celles-ci. Nous préférons les envois de manuscrits par e-mail (pièce jointe). Pour les envois sur papier, les textes seront tapés en deux exemplaires, d'un seul côté de la page, avec double interligne et larges marges. Consultez l'Éditeur pour tout détail supplémentaire, p. ex. les logiciels compatibles.

Tous les Articles (mais non les Notes Courtes) comporteront un **Résumé**, n'excédant pas 5% de la longueur totale. Le Résumé mentionnera brièvement les principaux résultats et conclusions de l'Article et ne sera pas un simple compte rendu du travail. Les résumés seront publiés à la fois en anglais et en français et seront traduits au mieux par la Rédaction.

Les **conventions** concernant les tableaux, les chiffres, le système métrique, les références, *etc.* peuvent être trouvées dans ce numéro et doivent être soigneusement suivies. Notez en particulier que les dates s'abrègeront comme 2 fév 1990 mais les mois écrits seuls pourront s'écrire en entier; que les heures s'éciront comme 6h45, 17h00; que les coordonnées s'éciront comme 7°46'N, 16°4'W; que les nombres jusqu'à dix s'éciront en entier, excepté devant une unité de mesure (p. ex. 6 m), que les nombres à partir de 11 s'éciront en chiffres sauf au début d'une phrase. Toute référence citée dans l'article, et aucune autre, doit figurer dans la bibliographie.

Les **articles d'avifaune** doivent comprendre une carte ou une liste des localités citées. Ils devraient donner quelques détails sur le climat, la topographie, la végétation et l'environnement (y compris les événements inhabituels) avant ou durant l'étude (p. ex. pluies tardives, *etc.*). Les **listes d'espèces** ne devraient contenir que des données importantes: les listes complètes ne sont justifiées que pour les régions encore non étudiées ou délaissées pendant longtemps. Autrement, ne citer que les espèces sur lesquelles l'étude fournit de nouveaux faits sur la répartition, la période de séjour, la reproduction, *etc.* Pour chaque espèce, indiquer l'extension de l'aire, une estimation d'abondance (*Malimbus* 17: 38) et les données datées sur la reproduction; indiquer le statut migratoire et la période de séjour seulement telles qu'elles ressortent de l'étude. Eventuellement, remplacez les faits dans le contexte en les comparant brièvement avec une liste régionale de référence. Les longues listes d'espèces peuvent être sous forme de tableaux (p. ex. *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) ou sous forme de texte des derniers numéros. La **séquence taxonomique** et les **noms scientifiques** (et de préférence aussi les **noms vernaculaires**) devraient suivre Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), ou Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) ou The Birds of Africa (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), à moins de donner les raisons de s'écarter de ces auteurs. Un **guide plus complet aux auteurs** d'articles sur l'avifaune, comprenant une notation d'abondance des espèces la plus conseillée, est publié dans *Malimbus* 17: 35–39. On peut en obtenir une copie de la Rédaction, qui se fera aussi un plaisir d'offrir ses conseils sur la présentation de ce genre d'études.

Les **figures** doivent être préparées pour une reproduction directe, permettant une réduction de 20–50%. Pour le dessin des Figures, tenir compte du format de *Malimbus*. On préfère les figures préparées sur logiciel graphique approprié et sauvegardées en haute définition. Elles doivent être envoyées comme fichiers de logiciel graphique, et ne pas être incluses dans un fichier de texte. Les fichiers de faible définition et les sorties sur imprimantes de mauvaise qualité seront refusés. On encourage les auteurs à soumettre des **photographies** qui illustrent des points importants de leurs articles. Les photographies doivent être bien contrastées (par être publiées en monochrome) et de haute définition (au moins 600 dpi). Elles doivent être envoyées comme fichier de logiciel graphique (par ex. jpg ou tif) et non pas être incluses dans un fichier de texte. Consulter le Rédacteur pour tout renseignement.

Une copie de la livraison dans laquelle paraient les Articles et les Notes Courtes sera envoyée gratis à l'auteur ou à l'auteur principal.

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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain



VOLUME 29 Number 1

March 2007

ISSN 0331-3689

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

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Correspondence should be addressed as follows:

- to the Managing Editor (Dr A. Tye, SPREP, PO Box 240, Apia, Samoa; <alantye@gmail.com>) regarding contributions to *Malimbus*;
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W.A.O.S. Research Grants: guidelines for applicants may be found in *Malimbus* 25: 72–75 and on the web site, or may be obtained from the Secretary to Council.

**Dialects in the song of the Splendid Sunbird
Cinnyris coccinigastra at the University of Ghana,
Legon, Ghana, February–April 2004**

by Llewellyn Grimes

3 St Nicholas Court, Warwick CV34 4JY, U.K. <lgrimes@freeuk.com>

Received 20 July 2005; revised 30 October 2006.

Summary

Songs of male Splendid Sunbirds were recorded periodically at nine locations where territorial males sang regularly at dawn usually within audible distance of each other, sometimes < 30 m apart. Dialects were distinguished by visual inspection of spectrograms and the mean time interval between the start of consecutive notes in a song (the mean time interval pattern) also characterised dialects. Three dialects were recorded at localities up to 500 m apart. Competing males at four locations sang the same dialect but at three others a sharp dialect boundary occurred and each male, no more than 40 m apart, sang its own distinct dialect. The spectrograms and mean time interval patterns obtained at each location remained unchanged for the duration of the study but none matched those obtained in the same area 30 years earlier. The estimated mean density of male Splendid Sunbirds in areas where they occurred at Legon was 0.45 ha^{-1} but their distribution was not uniform (range c. $0.25\text{--}1.85 \text{ ha}^{-1}$). Dialects may have arisen due to the patchy distribution of suitable habitat at Legon.

Résumé

Dialectes du chant du Soui-Manga éclatant *Cinnyris coccinigastra* à l'Université du Ghana, Legon, Ghana, février–avril 2004. Les chants de mâles du Soui-Manga éclatant ont été enregistrés périodiquement à neuf places où, régulièrement à l'aube, les mâles cantonnés chantaient habituellement à portée de voix, parfois à < 30 m les uns des autres. Les dialectes étaient distingués à l'examen visuel des spectrogrammes; l'intervalle de temps moyen au départ des notes consécutives du chant (type de l'intervalle de temps moyen) caractérisait aussi les dialectes. Trois dialectes ont été enregistrés à des places séparées de moins de 500 m. Les mâles rivaux de quatre endroits chantaient dans le même dialecte mais à trois autres endroits on observait une démarcation marquée des dialectes, et chaque mâle,

distant de moins de 40 m, chantait dans son propre dialecte. Les spectrogrammes et le type de l'intervalle de temps moyen obtenus au même endroit restèrent stables pendant la durée de l'étude mais sans aucune correspondance avec ceux obtenus au même endroit 30 ans auparavant. La densité moyenne estimée de Soui-Mangas éclatants mâles dans ces régions où on les rencontrait à Legon était de $0,45 \text{ ha}^{-1}$ mais leur distribution n'était pas uniforme (écart-type *c.* $0,25\text{--}1,85 \text{ ha}^{-1}$). Les dialectes ont pu se développer à la faveur de la distribution morcelée de l'habitat favorable à Legon.

Introduction

During the years 1970–3 I studied the song of the Splendid Sunbird *Cinnyris coccinigastra* in Ghana (Grimes 1974). Marked geographic variation in the song occurred between Accra and Cape Coast, but more surprising was the presence of distinct and readily discernible dialects spatially distributed on the campus of the University of Ghana at Legon. These were discovered early in the 1970s, when sample spectrograms of the songs of Splendid Sunbirds, tape recorded at four localities on the campus, were visually compared. In 1972, songs of a colour-ringed male, which sang regularly in the same tree, were tape recorded on 10 occasions over the period 30 May to 3 August 1972. The sound spectrograms and mean time interval patterns of his song (Fig. 8 and Table 3 in Grimes 1974) were similar throughout these two months. At one locality near the Department of Agriculture, the sound spectrograms were preserved over three years (the duration of the 1970s study). As visual inspection was sufficient to separate the dialects no other data were abstracted from the spectrograms.

A typical song of the Splendid Sunbird consists of 6–7 consecutive glissando notes (range 4–11), each lasting *c.* 0.2 sec (Fig. 1), and is repeated as the male advertises his presence and territory (mean rate in 2004 was 8.95 ± 1.63 songs/min. (range 6.25–12.83, $n = 34$). The structural simplicity of the song lends itself to the detection and study of dialects in a population.

In January 2004, I returned to the University of Ghana after an interval of 30 years and was able to investigate dialects and their distribution on the campus. Snatches of territorial song were first heard in early February but it was not until mid-March that males sang for prolonged periods in competition with others. A summary of the results is presented here. A report (subsequently termed the *Report*) containing all the data apart from spectrograms showing the dialects of competing males which have been added to this revised edition, has been sent to the Edward Grey Institute at Oxford, the Natural History Museum at Tring, the British Library in London, the Percy FitzPatrick Institute at the University of Cape Town, South Africa and the Department of Zoology, University of Ghana at Legon. Copies of the visual and sound recordings made have also been deposited at these Institutions.

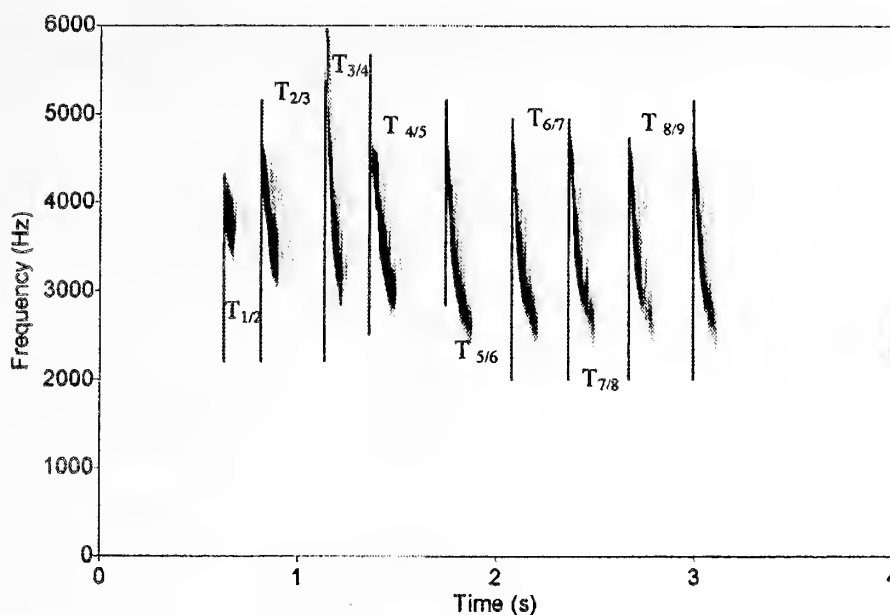


Figure 1. Spectrogram of a song sequence of Splendid Sunbird showing time differences ($T_{1/2}$, $T_{2/3}$ etc) between the start of consecutive notes, as measured for all sequences recorded.

Methods

All recordings of singing males were made between 5h40 and 6h10, when singing was prolonged and intense, apart from three (one at 8h00 in the Botanical Gardens; two briefly mid-morning near Commonwealth Hall and the University Library). The equipment was usually ready before the first male began singing. The locations chosen were those where Splendid Sunbirds were found singing at dawn in competition with each other, found by systematically walking around the campus. Many were singing in Little Legon and on Lower Hill but only two in East Legon near the Department of Agriculture and only three within the extensive Botanical Gardens.

Four of the locations where birds were tape recorded were close to areas where dialects were recorded in the 1970s (near 20 Little Legon, on Legon Hill, near the Department of Agriculture and within the Botanical Gardens). These and five others (Fig. 2, Table 1) were visited periodically during my three-month stay and songs of males, singing on each occasion from within the same tree or clump of trees at each locality, were tape recorded. Although none was colour ringed, the 1972 observations of the colour-ringed male suggest that any male Splendid Sunbird singing at dawn from the same tree or clump of trees was the same individual on each occasion.

Singing males were tape recorded and filmed using a Sennheiser MKE 300 directional microphone attached to a Sony video recorder (CCD-TR840E). Males often sang from exposed perches in the canopy when they were usually visible but sometimes obscured. On 12 separate occasions (Table 1) I recorded long unambiguous sequences of competing males in one session by systematically moving from one singing

male to the next while the first bird continued to sing. In addition, the songs of other more distant males were picked up by the microphone and were audible on play-back.

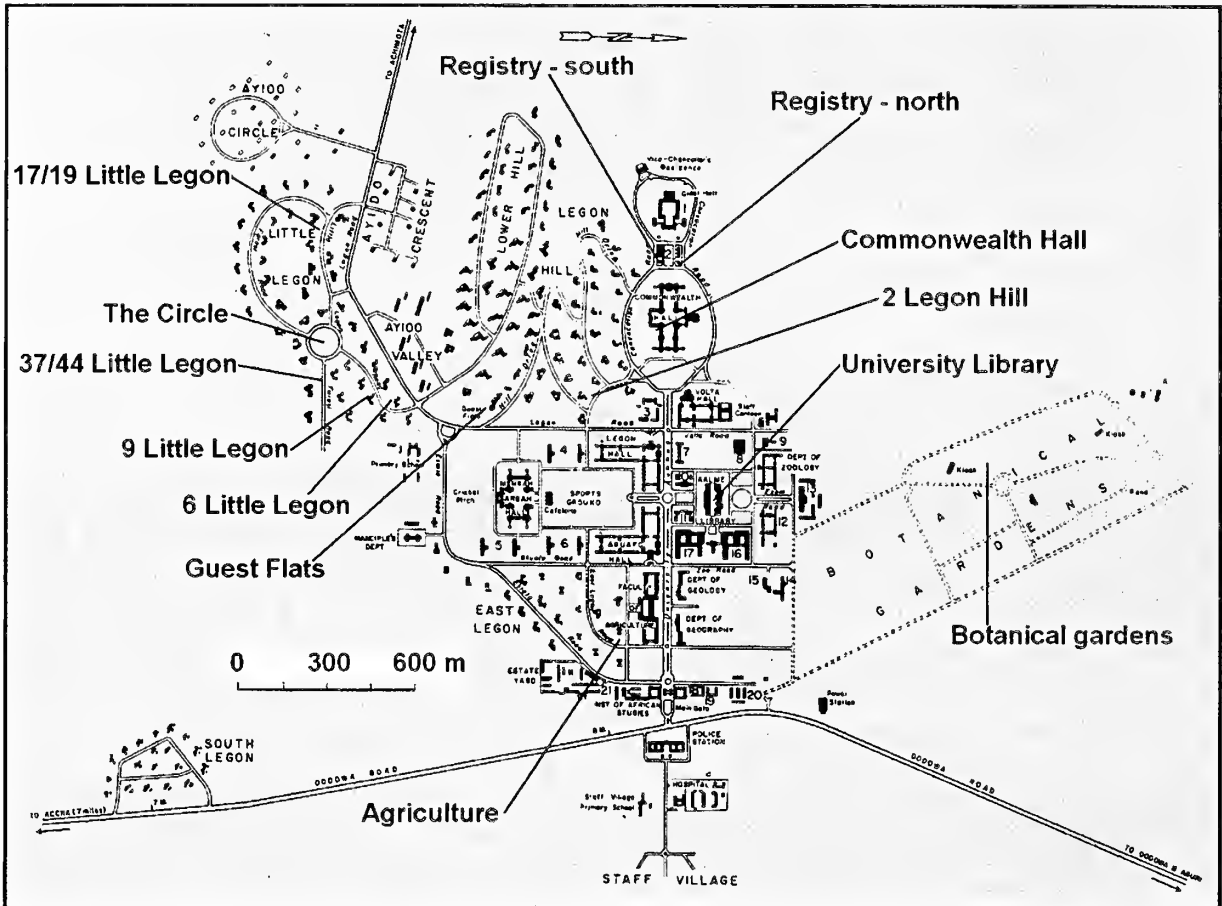


Figure 2. The locations where songs of male Splendid Sunbirds were tape recorded on the campus of the University of Ghana, Feb–Apr 2004.

Table 1. Locations and dates of sound recordings obtained in 2004 and numbers of males recorded.

Location	Dates (F = Feb, M = Mar, A = Apr) and no. of males recorded	Max. no. males recorded at site
2 Legon Hill	8F (1), 28F (1), 12M (1), 16M (1), 24M (1), 11A (2)	3
Registry (north)	28M (1), 29M (1), 30M (1), 11A (1), 14A (1)	3
Registry (south)	30M (1), 11A (1)	2
Botanical Gardens	3A (2), 10A (1), 16A (1)	3
Agriculture	1A (1), 2A (2), 10A (2)	2
6–9 Little Legon	3A (2), 6A (3)	3
17–19 Little Legon	31M (2), 5A (2)	2
37–44 Little Legon and Circle	14M (1), 19M (1), 7A (3)	2
Guest Flats	14M (2), 24M (1), 27M (2), 8A (2)	3

The camcorder data for each recording session (total 44) made at the nine locations were copied to a Sony high resolution videotape (E-180HR1), rendering both visual and audio data accessible when played on a television (Matsui TVR 185). Each session was analysed separately by feeding its audio signal from the television into a computer and producing a spectrogram of each song, using Praat.exe software (University of Amsterdam). The sampling rate was 44,100 Hz, which allowed 22 s of a recording — usually three or four song sequences — to be transferred each time for analysis. The start time of each note in a song sequence was read directly from its spectrogram and the time difference between the start of consecutive notes obtained. Each spectrogram of a given male yielded similar data and all spectrograms for a given male were used to calculate the mean time difference between the start of consecutive notes of its songs (the mean time interval pattern). Mean time interval patterns were obtained for all males recorded (Table 1). Spectrograms of songs of competing males were often present on a 22 s sample and many were clear enough to provide data on the time differences between the start of the notes in their songs. Thus it was possible to obtain an unambiguous sound spectrogram and time interval pattern of the songs of two or more competing males counter-singing. I did not abstract frequency characteristics of each note in a song sequence, though the software provided these data.

Results

Visual inspection of the frequency-time profile of male's dawn songs at the nine locations (spectrograms from all nine are illustrated in Figs 3, 5, 7 and 9) is sufficient to identify eight distinct dialects (A, B, C, D, E, F, G and H). Spectrograms of recordings made on different dates at each location confirmed the presence of the same dialect and these are illustrated in the *Report*. Some dialects were recorded at more than one location, *e.g.* Dialect C at 17/19 Little Legon and 550 m further east at 9 Little Legon (Figs 3 and 7), and Dialect D at the Guest Flats and *c.* 400 m south near 6 Little Legon (Figs 5 and 7). In addition, the male recorded briefly near Commonwealth Hall (27 Feb) sang four sequences of Dialect H (Fig. 9 and *Report*), which was the dialect recorded south of the Registry (30 Mar and 11 Apr) some 300 m to the west.

The corresponding mean time interval patterns of each song in Figs 3, 5 and 7 are given in Figures 4, 6 and 8, in which 41 of the 42 recording sessions at these eight locations have been used. The remaining one (11 April at 2 Legon Hill) appears in the *Report* and follows closely the pattern in Fig. 4. The mean time interval patterns for the two males recorded on the south side of the Registry (30 March and 11 April) appear in the *Report*. The mean time difference patterns were reproducible at each location but whereas some were quite different from each other, *e.g.* those at 2 Legon Hill (Fig. 4), 17/19 Little Legon (Fig. 4), Agriculture (Fig. 6), and Botanical Gardens (Fig. 6), others were more similar, *e.g.* at 17/19 Little Legon (Fig. 4) and the Guest Flats (Fig. 6), although the spectrograms of songs recorded at these two locations were not.

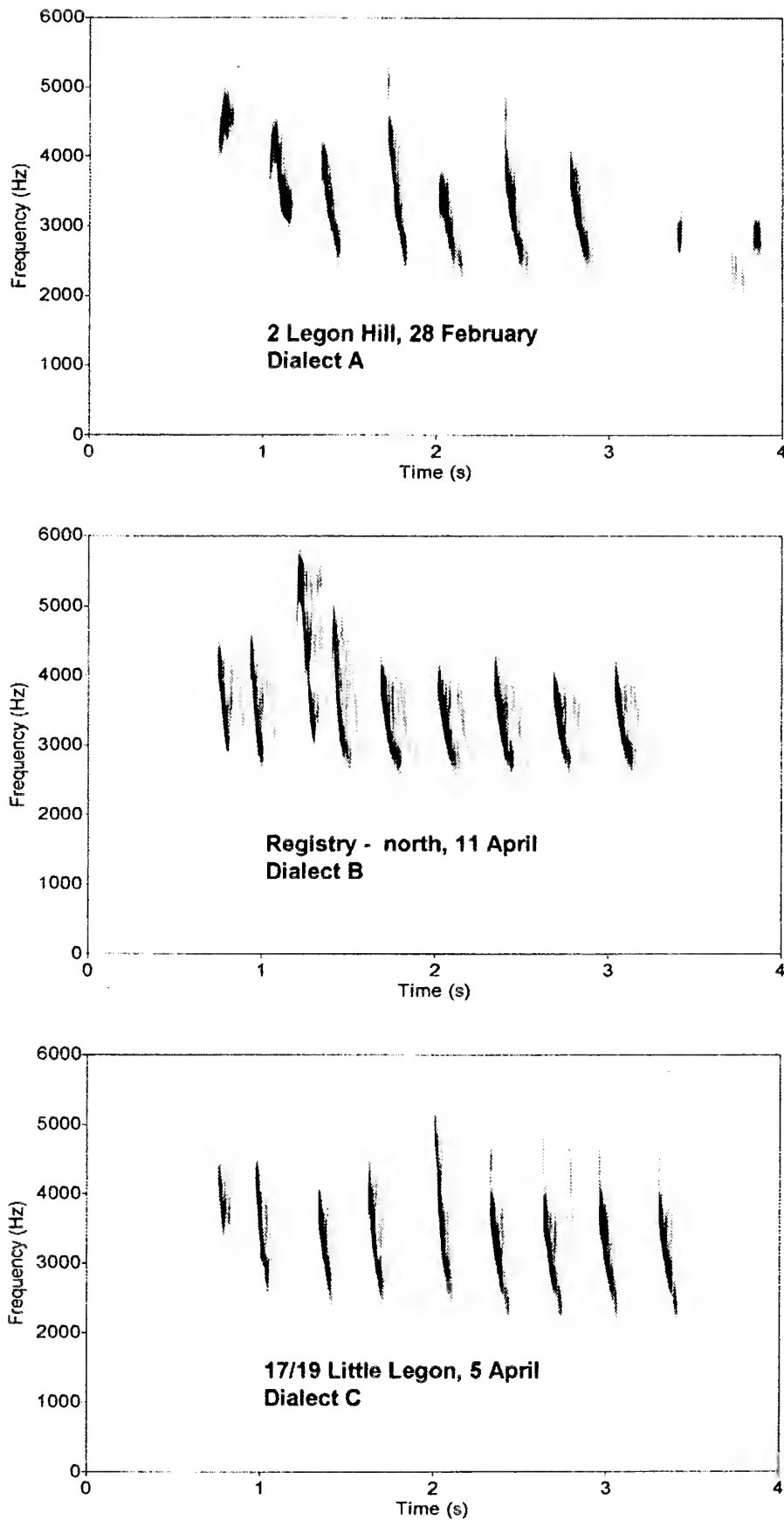


Figure 3. Typical spectrograms of song dialects of male Splendid Sunbirds recorded in 2004 at three localities at the University of Ghana, Legon.

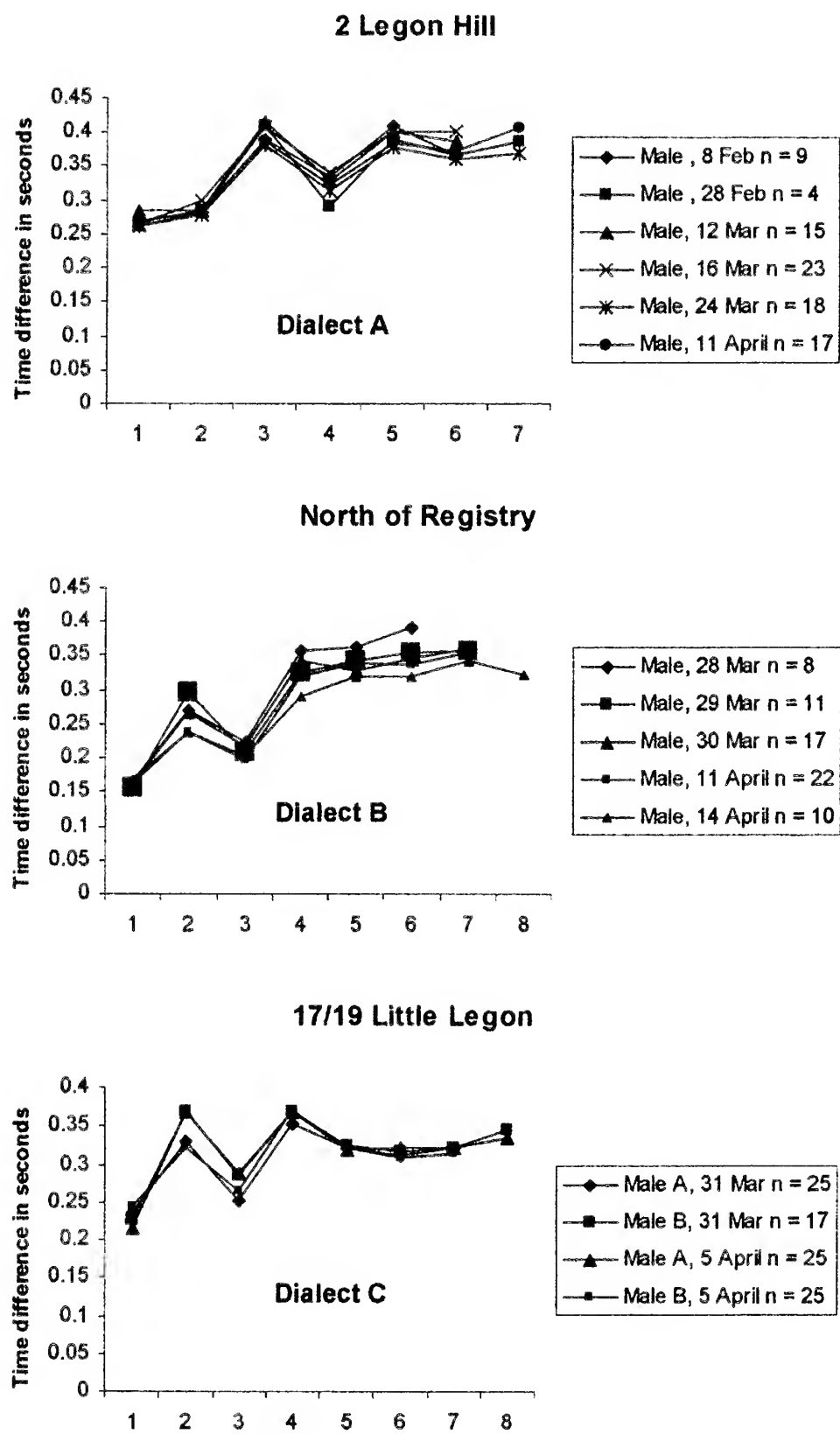


Figure 4. The mean time differences between the start of consecutive notes in the songs of Splendid Sunbirds recorded in 2004 at the three localities from which spectrograms are illustrated in Fig. 3. The x-axis identifies the note pairs used in obtaining the time difference (1 = first and second notes, 2 = second and third notes, etc.).

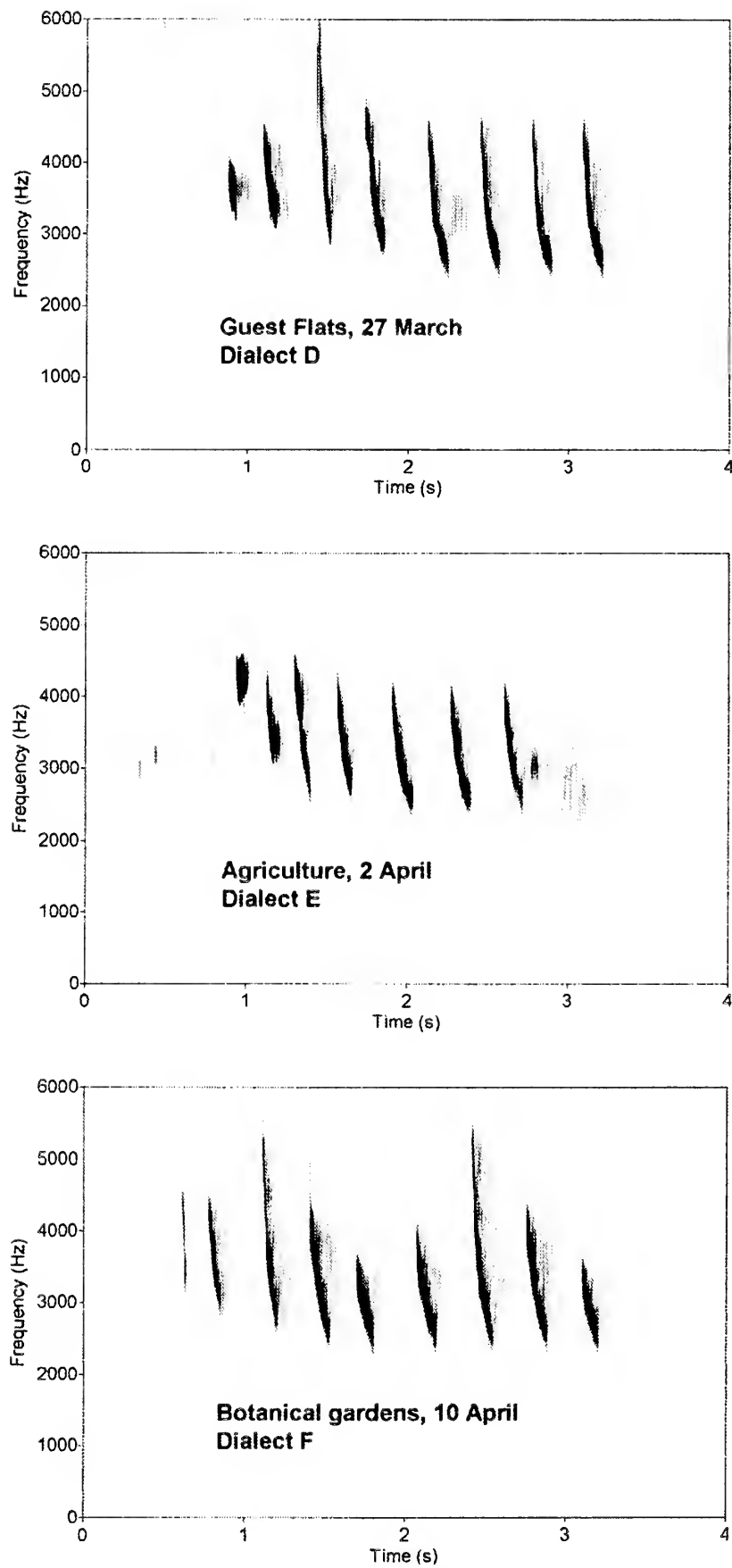


Figure 5. Typical spectrograms of song dialects of male Splendid Sunbirds recorded in 2004 at three localities on the campus of the University of Ghana, Legon.

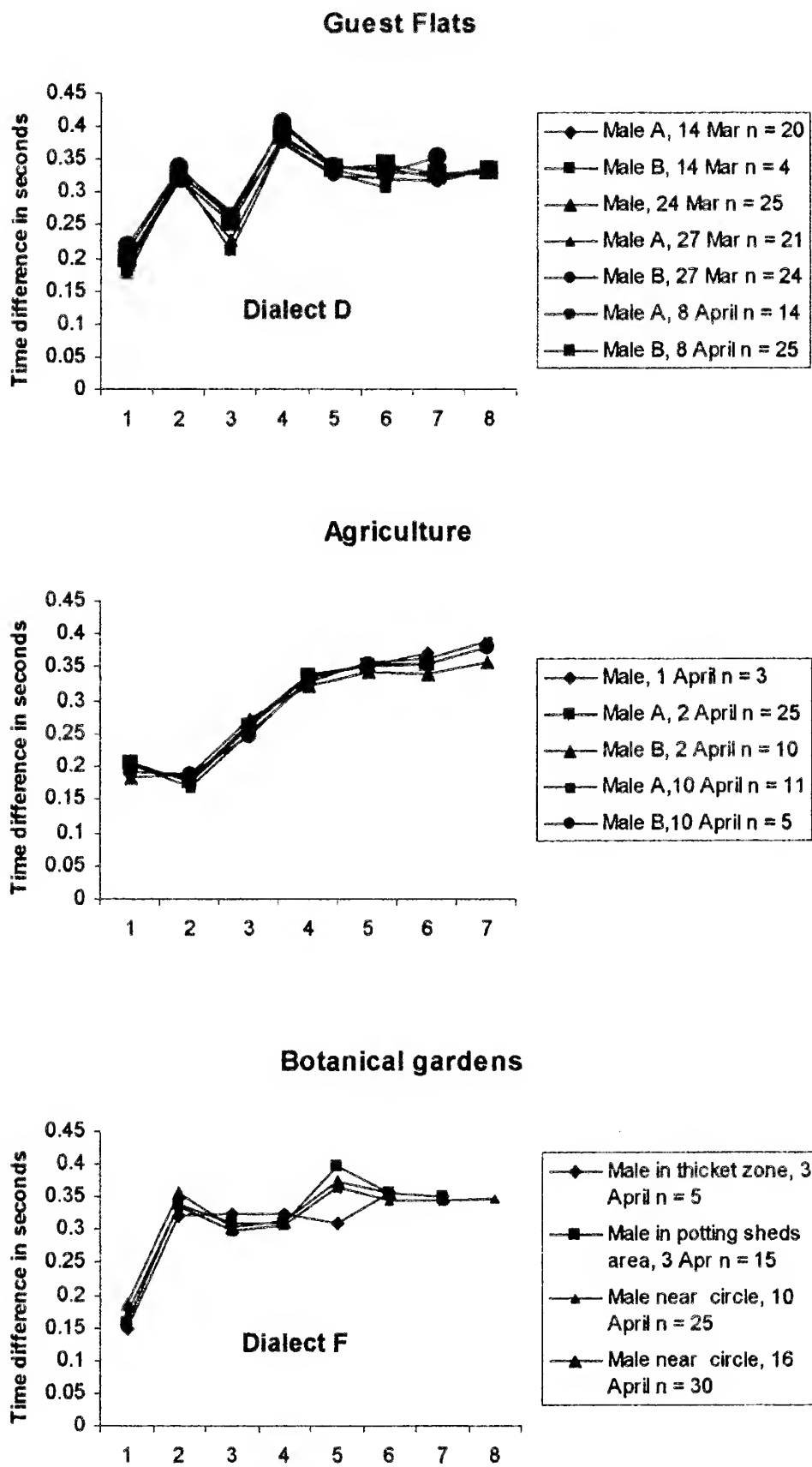


Figure 6. The mean time differences between the start of consecutive notes in the songs of Splendid Sunbirds recorded in 2004 at the three localities from which spectrograms are illustrated in Fig. 5. X-axis labelling as Fig. 4.

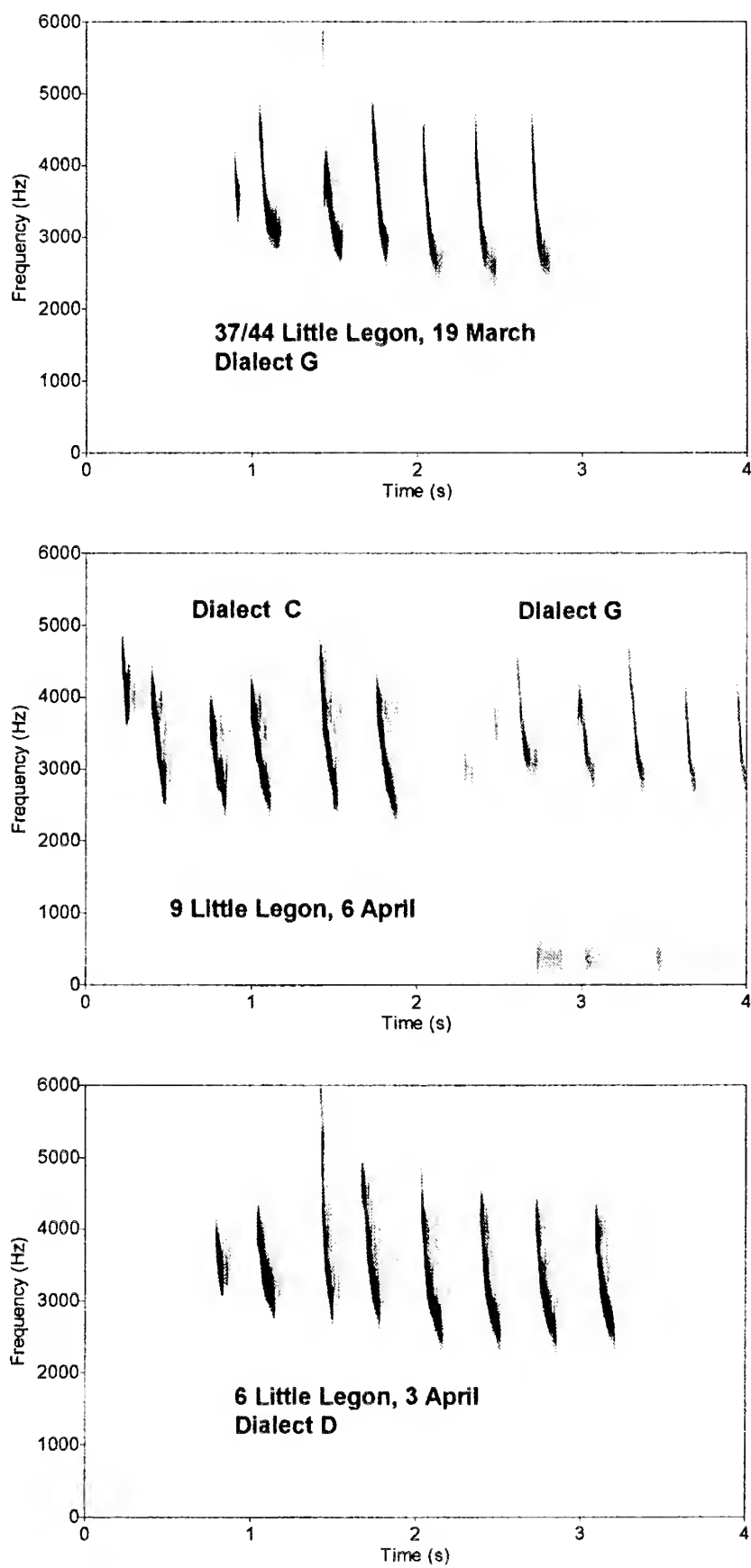


Figure 7. Typical spectrograms of song dialects of male Splendid Sunbirds recorded in 2004 at three localities on the campus of the University of Ghana, Legon.

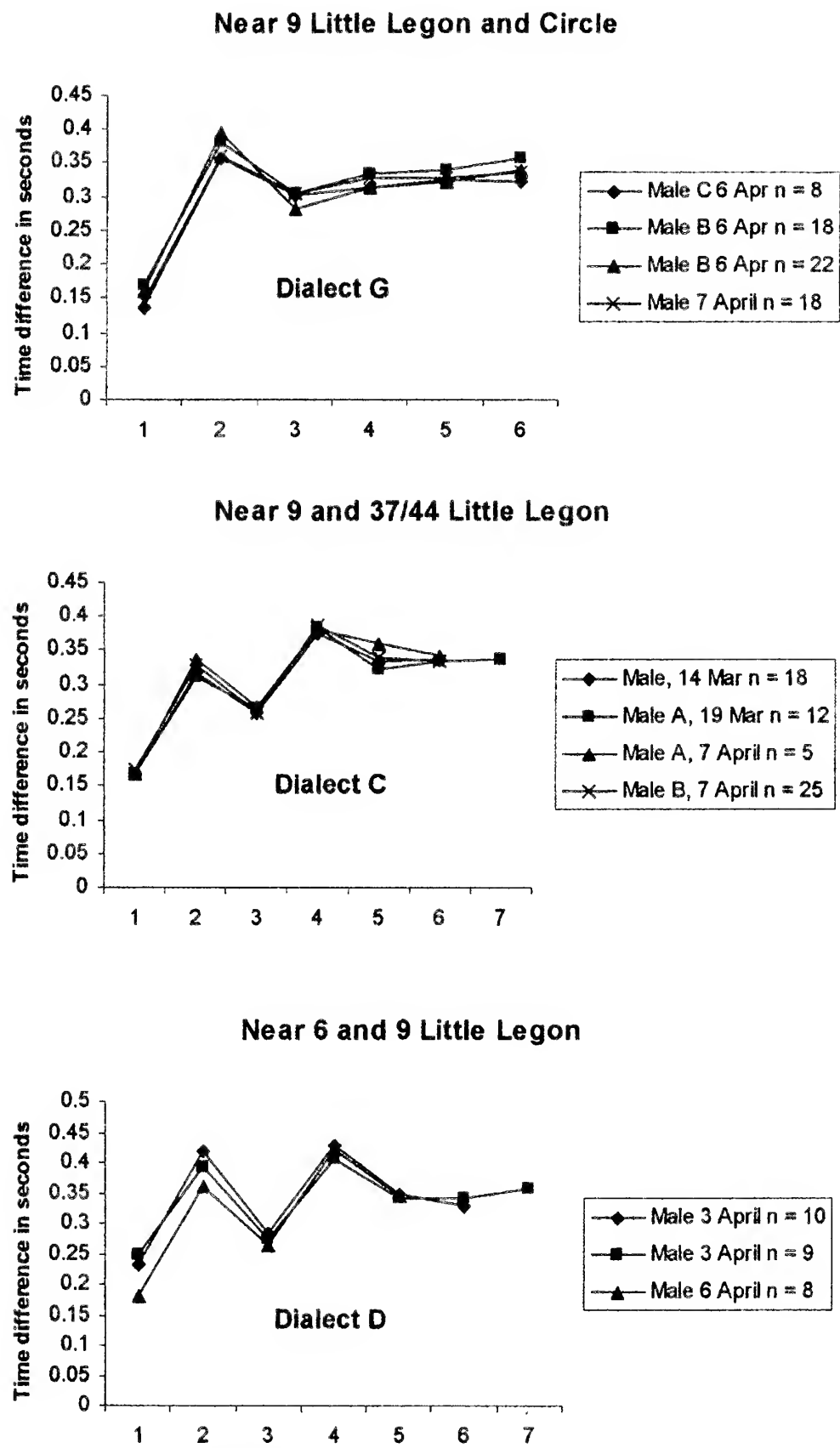


Figure 8. The mean time difference patterns for dialects C, D and G recorded in 2004 at the three localities from which spectrograms are illustrated in Fig.7. X-axis labelling as Fig. 4.

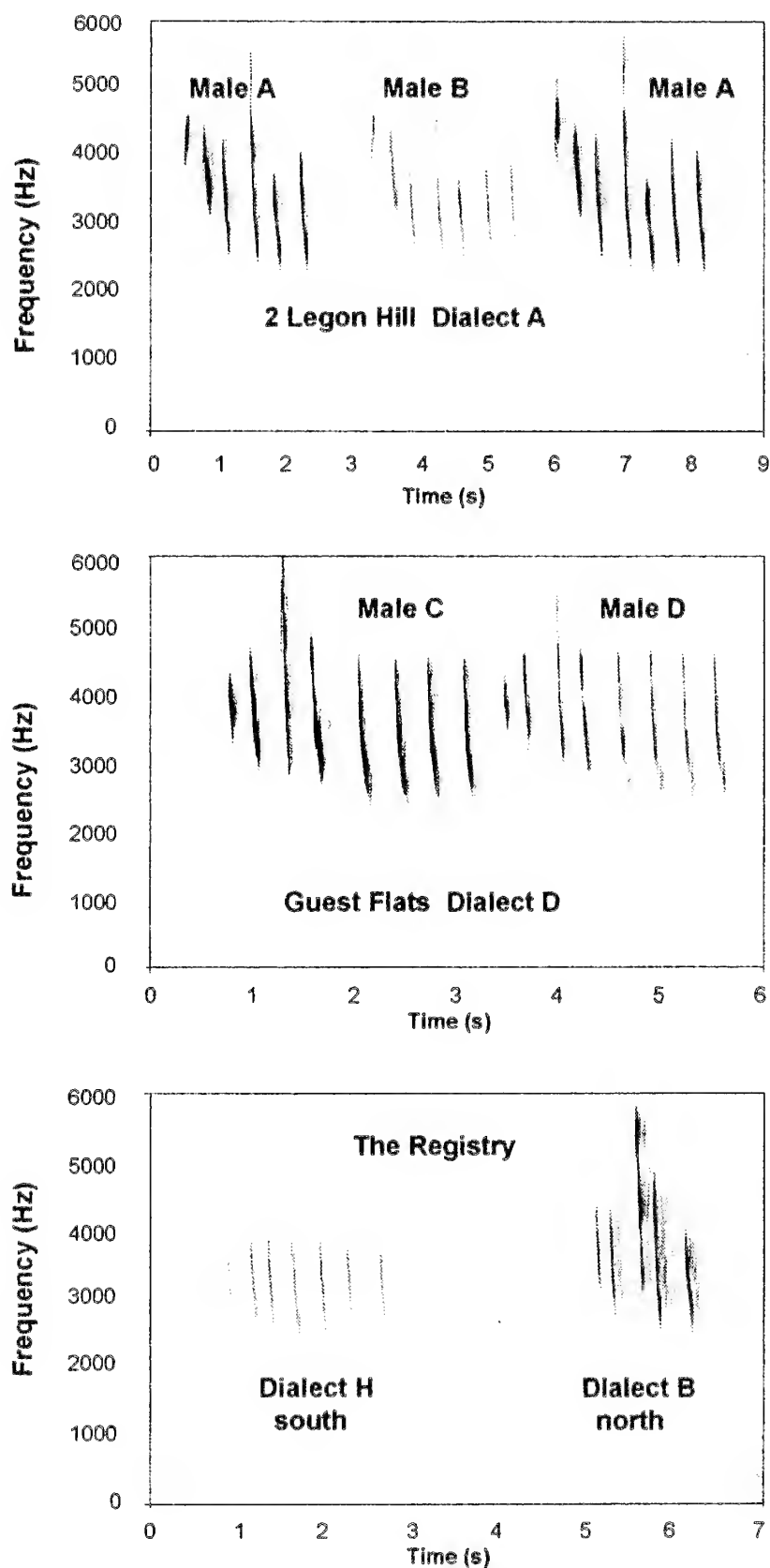


Figure 9. Spectrograms of songs of male Splendid Sunbirds singing in competition with each other at 2 Legon Hill, at Guest Flats and at the Registry. Competing males sang the same dialect at the first two locations (dialects A and D respectively) but different dialects (B and H) at the Registry.

Competing males some 20–40 m apart were recorded singing an identical dialect at 2 Legon Hill (Dialect A in Figs 3 and 9), and at the Guest Flats (Dialect D in Figs 5 and 9), and also, but not illustrated here, at 17/19 Little Legon and at Agriculture. In contrast, competing males sang quite different dialects on the north and south side of the Registry (Dialects B and H in Fig. 9), while in Little Legon at least three dialects (C, D and G in Fig. 7) were detected within a small area (*c.* 2.7 ha) which included gardens of houses 6, 9, 37 and 44 and the parkland bordering the eastern edge of the Circle (Fig. 2).

The spectrograms ($n = 6$) and mean time difference pattern (see *Report*) of the male's song briefly recorded near the University Library complex (26 Mar) matched none recorded elsewhere on the campus. In addition, the frequency/time slope of its first note was positive whereas in all other songs recorded, except those at 2 Legon Hill (Figs 3 and 9), the slope was negative.

No playback experiments involving "foreign" dialects were undertaken but on three occasions playback of a male's own song was followed by the singing male stopping soon after the playback began and remaining silent for some time after the playback was stopped before beginning to sing again.

The area of the campus within which Splendid Sunbirds were tape recorded at the eight locations was *c.* 51 ha and the number of sunbirds that could be heard on the tape recordings at each of the eight locations was never more than three. Since the microphone was directional, this yields a population estimate of 23 (Table 1) and a minimum mean density of males of 0.45 ha^{-1} . However the sunbird was not uniformly distributed. Thus in the restricted area (*c.* 2.7 ha) of Little Legon (total area *c.* 25 ha), where three dialects were detected, at least five males occurred (density *c.* 1.85 ha^{-1}) whereas within the Botanical gardens only three males occurred within an area of *c.* 12 ha (density 0.25 ha^{-1}).

Discussion

Neither mean time difference patterns nor spectrograms of the songs of the Splendid Sunbird recorded on the campus in the 1970s (Figs 3 and 6 in Grimes 1974) match those obtained in 2004, although there are some similarities in the mean time difference patterns of the sunbirds singing near the Agriculture Department (Fig. 5 of this paper and Fig. 3 of Grimes 1974). This is perhaps not surprising as the interval of time represents at least 30 generations of sunbirds.

The new data confirm the earlier findings (Grimes 1974) that the spectrograms of songs recorded at a given location were reproducible over time, and that competing sunbirds may sing the same dialect (Fig. 9), or different ones, in which case the dialect boundary is relatively sharp (Figs 7 and 9). Recently, two distinct dialects have been found in a colour-ringed urban population of Orange-tufted Sunbirds *Nectarinia osea* in Israel (Leader *et al.* 2000). One was sung by 37 males the other by 21, and

four males used a hybrid song. A male's song type did not change over the breeding season or from year to year, and males of both dialect groups responded more positively to playback of their own dialect than to playback of the other. Their data indicate a higher population density of Orange-tufted Sunbirds (6.4 males/ha) than of the Splendid Sunbird at Legon, with a distribution remarkably uniform compared with that of the Splendid Sunbird at Legon.

The presence of distinct dialects in the population of Splendid Sunbirds at Legon is in marked contrast to what Payne (1978) found in the population on the campus of Cape Coast University in September 1975. He sampled the songs of most, if not all, sunbirds singing on the 6 km² campus and was not able to distinguish dialects in most of his birds. Although he confirmed local song variation, he found that variations in space were not grouped into discrete dialects. Subsequently Schnell *et al.* (1985) have re-analysed Payne's data and were able to attach measures of statistical significance to Payne's evaluation. Their conclusions were the same as Payne's, that males furthest apart had the most dissimilar songs whereas those of close neighbours were relatively more similar to each other than predicted by chance, and that differences in song were not due to differences in habitat. At Cape Coast, 39 males occupied *c.* 237 ha which gives a density of 0.164 males/ha.

Payne (1978) thought that the differences in the results of his study at Cape Coast and the one at Legon were due to differences in sampling methods. He made a short visit to Legon in November 1975, when Splendid Sunbirds were silent, and considered the whole of the campus a uniform habitat suitable for Splendid Sunbirds. Although he does not indicate how many he saw he considered it more than likely that many more Splendid Sunbirds may have occurred on the campus and in the surrounding areas than were recorded in the 1970s. That is true as it was not intended to sample all singing sunbirds in the 1970s but rather concentrate on those singing in one location over a period. However, whether or not discrete dialects occur should not depend on sampling techniques: they are either present or absent. The present data substantiate that of the 1970s, and suggest that the differences between the findings of the two studies at Legon and at Cape Coast are real and merit further study.

My observations also suggest that the campus was and is not uniformly attractive to sunbirds as thought by Payne. In 2004, as in the 1970s, no singing sunbirds were located at dawn in the area of thicket between the southern border of the Botanical Garden and the Zoology and Botany departments and lecture room complex (Fig. 2), nor between these buildings and the University Library. In terms of tree cover, the staff residential areas of Legon Hill, Little Legon, Lower Hill, East Legon and Ayido valley appear uniform and have changed little from the 1970s, though trees are taller and their canopies more extensive. A variety of flowering trees is present in the older residential areas of Legon Hill, Little Legon and East Legon and this is where sunbirds were found singing in the 1970s and in 2004. In contrast, on Lower Hill and in Ayido Valley the Neem *Azadiracta indica* tree dominates the landscape and flowering trees suitable for sunbirds are scarce. The rest of the campus is and was,

although to a lesser extent, equally unfavourable to Splendid Sunbird as much of it consists of faculty buildings, student Halls and Annexes, and playing fields which are criss-crossed with foot paths used throughout the day by students. Although flowering Copper Pods *Peltophorum pterocarpum* occurred along roads and Rain Trees *Samanea saman* around playing fields in the centre of the campus, the increase in noise level due to traffic and a 10-fold increase in student numbers do not create a suitable environment for Splendid Sunbirds.

There is no generally accepted explanation of the mechanism maintaining local dialects or of their functional significance (Catchpole & Slater 1995), nor how they develop. Leader *et al.* (2000) suggested that dialects in the Orange-tufted Sunbird may have arisen from the pattern of human settlement which had begun in the early 1950s and that the spatial distribution of the two dialect populations and a low dispersal rate from dialect areas has helped to maintain them. Interestingly, the area of the Accra Plains now occupied by the University campus consisted of a mixture of grassland and thicket patches until the late 1950s when the present campus was landscaped. Although the distinctive dialects on the campus at Legon appear genuine and the sunbird distribution is not uniform, the number of males singing the same dialect and the spatial extent of each remain unknown. Their existence and development may be due to the patchy nature at Legon of the habitat suitable for sunbirds (P. McGregor pers. comm.).

Acknowledgments

I am most grateful for the helpful comments on the data presented in the *Report* by Dr Peter McGregor and Dr J. Wright and thank also Dr F. Walsh and Dr Derek Pomeroy for encouraging me to prepare a summary of the data for publication. Dr Robert Cheke helpfully commented on this present script.

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Avifauna of Omo Forest Reserve, SW Nigeria

by A.A. Green¹, P. Hall² & A.P. Leventis³

¹178 Patten Road, Shelburne Falls, MA 01370, U.S.A. <greenarthura@hotmail.com>

²27 Mekuwen Road, Ikoyi, Lagos, Nigeria. <110226.2654@compuserve.com>

³19 Ilchester Place, London W14 8AA, U.K.

Received 28 October 2005; revised 15 October 2006.

Summary

We recorded 210 bird species of 52 families in Omo Forest Reserve, SW Nigeria. Amongst these, 20 are Palaearctic migrants and at least 26 others are either intra-African migrants or exhibit significant local movements. Most passerines that we recorded are resident species.

Résumé

Avifaune de la Réserve Forestière de l'Omo, SO du Nigeria. Nous avons enregistré 210 espèces d'oiseaux, de 52 familles, dans la Réserve Forestière de l'Omo, dans le sud-ouest du Nigeria. Parmi celles-ci, 20 sont des migrateurs paléarctiques, et au moins 26 sont soit des migrateurs intra-africains, soit des migrateurs locaux. La plupart des passereaux sont des résidents.

Introduction

Omo Forest Reserve (FR) is one of six contiguous forest reserves covering *c.* 5000 km² in Ogun and Ondo States, *c.* 160 km east of Lagos, in SW Nigeria. First proposed in 1916, Omo FR was constituted in 1925, and took its present form in the 1950s. It lies between 6°35' and 7°5'N and between 4°12' and 4°33'E, and covers 1391 km² (Fig. 1). The reserve is divided into four administrative areas, two on each side of the Omo River: J-4 (NE), J-6 (SE), J-1 (NW), and J-3 (SW). J-4 Town is in the south-centre of the J-4 Area, 14 km north of the Lagos–Benin City (E–W) expressway. The J-6/J-4 boundary is half way between the town and the expressway. J-4 Town is the largest of several villages in the J-4 Area and site of a sawmill that has been in operation since the 1940s. Excepting in the east, most of the J-4 Area and the portion of the J-6 Area north of the expressway (*c.* 40% of the reserve) was converted to *Gmelina arborea* tree plantation during the 1970s and 80s, a World Bank project. The plantation project is an ongoing programme of Ogun State Government.

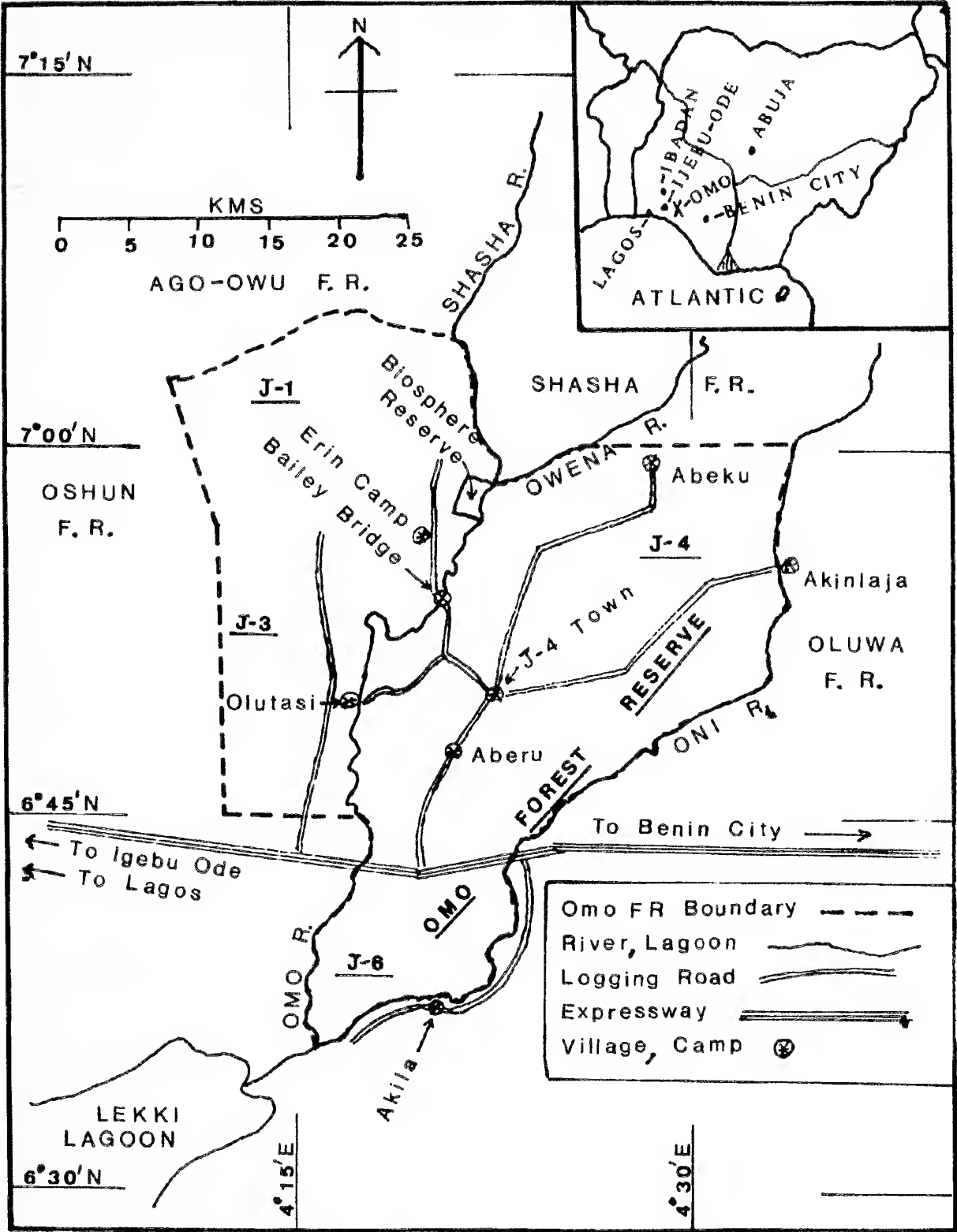


Figure 1. Sketch map of Omo Forest Reserve, Ogun State, Nigeria, showing important areas referred to in the text.

The “Etemi Inviolable Plot” of 4.6 km² was demarcated in the J-3 Area in 1946. This became a Strict Nature Reserve in 1954 and a UNESCO Biosphere Reserve in

1977. In the interest of elephant protection, the Nigerian Forest Elephant Group (NFE) was established in the early 1990s. NFE and the Ogun State Department of Forestry created a Biosphere Extension Area (BEA), a buffer zone around the Biosphere Reserve, to offer more protection to forest elephants and their habitat. NFE was given stewardship of the BEA in 1993 and established a study camp (Erin Camp) on a hilltop 15 km north of J-4 Town in the J-3 Area. Most bird observations made since the late 1980s were made near Erin Camp, near the Bailey bridge over the Omo River, and around J-4 Town.

No previous papers have been published on the birds of Omo FR. Farmer (1979) produced a checklist of birds from around Ile-Ife (7°29'N, 4°33'E), an area of secondary forest and farmlands north of Omo FR. His area, having three small lakes, attracted ducks and other water birds not found at Omo FR. Akinpelu (1994a, b) did a moulting study of two *Lonchura* species and a breeding study of three estrildid species at Ile-Ife. Sodeinde (1993) studied the breeding of Laughing Dove *Streptopelia senegalensis* at Ijebu-Ode (6°49'N, 3°56'E).

Study Area

Omo FR is near the W limit of the rainforest zone in Nigeria, approaching the Dahomey Gap. Based on rainfall records at Akilla at the southern end of the J-6 Area (annual average 2004 mm over 43 years) and Ijebu-Ode, 40 km west of J-4 Town (1626 mm over 25 years), average annual rainfall is probably 1800–2000 mm over most of the reserve, with higher amounts in the south near the sea. Although there is considerable year-to-year variability in the start and end of the rainy season, Nov–Mar can generally be considered as the dry season (<100 mm rainfall per month). The hottest time is during Mar–Apr (highs of 36–38°C at J-4 Town) until the start of the rains. Temperatures usually remain in the 20s during Jul–Aug, when it is overcast and rainy much of the time. Night-time temperatures have fallen to 16°C at J-4 Town during Dec–Jan.

The Omo River flows from north to south through the centre of the reserve, while the Oni River marks the eastern boundary. These rivers join at the southern tip of the reserve, 5 km from Lekki Lagoon and 25 km from the Atlantic Ocean. Much of the reserve consists of rolling hills 50–100 m above sea level, with some low outcroppings in the north reaching 200 m elevation. Soils are derived from underlying Precambrian granite, gneiss and schist. In the J-6 Area south of the Expressway, on flat land with sandy soil, barely above sea level, there are extensive freshwater swamps.

“J-4 Pond” is a large, manmade pond near the J-4 Plantation Project guesthouse on the outskirts of J-4 Town, and there are two fishponds nearby. Other locations are shown in Fig. 1.

Trees of the swamp forest include *Lophira alata*, *Symphonia globulifera*, *Nauclea pobeguinii*, and the palm *Raphia hookeri*. No-one has yet investigated the avifauna of this part of Omo FR. The central reserve area (where our bird records were made) is

covered with either moist rainforest, characterized by trees of the Leguminosae and Meliaceae, or *Gmelina arborea* plantation interspersed with some small villages, farms and small cacao plantations. The northern J-1 Area has a drier rainforest cover characterized by trees of the Sterculiaceae, Moraceae, and Ulmaceae. Lowe *et al.* (1992) is a good source for additional information about the vegetation of Omo FR.

The large mammalian fauna is very uncommon, due to intensive bushmeat hunting. The Leopard is believed to be extinct; Forest Elephant, Forest Buffalo, and Western Chimpanzee populations are low but are of particular interest, being the last remaining ones this far west in SW Nigeria.

Methods

AG observed birds while going about his other project duties. Other authors made bird-watching forays. Sequence and nomenclature follow Borrow & Demey (2001). Abundance: R = rare (1 or 2 records), U = uncommon (a few records per year); F = frequent (seen often, but not every day); C = common (1–10 seen or heard daily); A = abundant (more than 10 seen or heard daily). Status is usually self-evident, but local movements are mentioned, as indicated by periods of presence/absence in the area. Many old records, although well established, lack detailed location, date and abundance information. Observers' initials are given where deemed important.

Results

Below we present a list of 210 bird species in 52 families known from Omo FR, of which 30 % were added to the list during the year 2000.

Podicipedidae

Tachybaptus rufficollis Little Grebe. R. One on a pond near Oloji Village (15 km east of J-4 Town), 23 Nov 2000 (AG).

Ardeidae

Ixobrychus sturmii African Dwarf Bittern. R. One in aquatic habitat edge, 8 Mar 1998 (PH).

Bubulcus ibis Cattle Egret. U. Small flocks along the E–W Expressway (J-6 Area) Nov–May, but absent Jun–Oct during the period of heaviest rainfall.

Butorides striatus Green-backed Heron. F. Omo River; also J-4 Pond during Dec–Jan.

Egretta garzetta Little Egret. R. One seen 14 Feb 1988 (PH).

E. alba Great Egret. R. One soaring over Abeku Village 11 Dec 2000 (AG).

Ardea purpurea Purple Heron. R. Pair at J-4 Pond, 26–28 Mar 2000 (AG).

A. cinerea Grey Heron. U. One at J-4 Pond mid-Feb to early Apr 2000; one soaring over Erin Camp 28 Nov 2000; one over J-4 Town 5 Dec 2000 (AG).

Threskiornithidae

Bostrychia hagedash Hadada Ibis. C. Omo and Oni rivers and also smaller streams.

Anatidae

Pteronetta hartlaubii Hartlaub's Duck. U. A pair on a pool by the Osoko Road north of J-4 Town, mid-Jun 2000; a pair at J-4 Pond 6 Dec 2000; old records.

Accipitridae

Pernis apivorus European Honey Buzzard. R. Old records.

Macheirhamphus alcinus Bat Hawk. R. Old records.

Elanus caeruleus Black-shouldered Kite. R. One at J-4 Town from 21 Dec 2000 to mid-Jan 2001, often resting and hunting from the J-4 sawmill radio tower (AG).

Milvus migrans Black Kite. A. Dry season visitor, absent mid-Jun to late Sep, becoming abundant by mid-Oct.

Gypohierax angolensis Palm-nut Vulture. C. More common in the *Gmelina* plantation and along the Omo River than in true primary or secondary forest.

Necrosyrtes monachus Hooded Vulture. U. Aberu village and in large villages along the E-W Expressway in the dry season; wet season status unknown (AG).

Polyboroides typus African Harrier Hawk. C. Widespread in all habitats.

Accipiter tachiro African Goshawk. C. Secondary forest and *Gmelina* plantation.

Urotriorchis macrourus Long-tailed Hawk. R. One seen 8 Mar 1998 (PH).

Kaupifalco monogrammicus Lizard Buzzard. C. More common in *Gmelina* plantation than elsewhere.

Buteo auguralis Red-necked Buzzard. C. Dry season visitor (Nov–Mar) to *Gmelina* plantation.

Aquila rapax Tawny Eagle. U. Pair near J-4 Town 5 Dec 2000 (AG); old records. Probably a dry season visitor from the north.

Hieraaetus ayresii Ayres's Hawk Eagle. R. One seen 22 Feb 1998 (PH); another resting on a dead tree next to the Omo River, 16 Mar 2000 (photographed, AL). Also found north of the reserve near Ife (Elgood *et al.* 1994).

Stephanoaetus coronatus Crowned Eagle. F. Primary and secondary forest; heard calling more often May–Sep than during the dry season. Rare in Nigeria (Elgood *et al.* 1994).

Falconidae

Falco tinnunculus Common Kestrel. R. One at Aberu village, 6 Jul 2000 (AG).

F. biarmicus Lanner Falcon. U. One, J-4 Town, 21–22 Dec 2000 (AG); old dry season records.

Phasianidae

Francolinus lathamii Latham's Forest Francolin. F. Primary and secondary forest.

F. bicalcaratus Double-spurred Francolin. C. Farmlands near villages in J-4 Area.

Numididae

Guttera pucherani Crested Guineafowl. C. Forest and *Gmelina* plantation.

Rallidae

Himantornis haematopus Nkulengu Rail. C. Found along swampy streams in the forest; heard calling at Erin Camp nearly every night or early morning (PH). One running down a logging road at mid-day, 15 May 2000 (AG). Rare in Nigeria (Elgood *et al.* 1994).

Sarothrura pulchra White-spotted Flufftail. F. Forest, often heard calling mornings and evenings near Erin Camp, where there are many swampy streams.

Crex egregia African Crake. C. Tall grassy areas around J-4 Town May–Oct but absent in dry season (AG). Reportedly present all year in the Lagos area, but other southerly records are mostly from the dry season (Elgood *et al.* 1994). However, farther east along the Niger River near Agenebode (7°N, 6°30'E) it is also a wet season visitor (PH).

Amaurornis flavirostris Black Crake. F. Found at J-4 Pond, but difficult to observe in wet season due to the tall vegetation at pond edges (AG).

Gallinula chloropus, Common Moorhen. R. One seen 14 Feb 1988 (PH).

Heliornithidae

Podica senegalensis African Finfoot. U. One on the Omo River 14 Feb 1988 (PH); old records.

Jacanidae

Actophilornis africana African Jacana. C. Several at J-4 Pond throughout the year.

Recurvirostridae

Himantopus himantopus Black-winged Stilt. R. One at J-4 Pond, Feb–Mar 2000 (AG).

Charadriidae

Charadrius forbesi Forbes's Plover. C. A half-dozen seen daily, J-4 Pond, Jan–Apr 2000 (AG).

Vanellus albiceps White-headed Lapwing. U. Dry season visitor to Omo River.

Scolopacidae

Gallinago gallinago Common Snipe. R. One at J-4 Pond 29 Mar 2000 (AG).

Tringa erythropus Spotted Redshank. R. One at J-4 Pond, Feb–Mar 2000 (AG).

T. nebularia Common Greenshank. U. One at J-4 Pond, late Mar to early Apr 2000; a pair circling J-4 Pond, 12 Nov 2000 (AG).

T. ochropus Green Sandpiper. R. One at J-4 Pond 15 Mar 2000 (AG).

T. glareola Wood Sandpiper. R. One at J-4 Pond during Mar 2000 (AG).

Actitis hypoleucos Common Sandpiper. C. Omo and Oni rivers and J-4 Pond Sep–Apr; returning birds first noted at the J-4 Town fishponds on 20 Aug 2000 (AG).

Columbidae

Treron calva African Green Pigeon. C. Widespread in all habitats.

Turtur brehmeri Blue-headed Wood Dove. C. Forest understorey (photo by AL).

T. tympanistria Tambourine Dove. A. Widespread, heard calling all day.

T. afer Blue-spotted Wood Dove. C. Farmland and *Gmelina* plantation.

Streptopelia semitorquata Red-eyed Dove. C. Omo and Oni Rivers, at villages and along watercourses in farmland, and in the *Gmelina* plantation.

Psittacidae

Psittacus erithacus Grey Parrot. U. In the mid-1990s, flocks of over 100 still occurred; now uncommon although still widespread (PH).

Musophagidae

Corythaeola cristata Great Blue Turaco. U. Widespread in the forest but now uncommon due to hunting pressure and habitat changes caused by intensive logging.

Tauraco macrorhynchus Yellow-billed Turaco. A. Forest and *Gmelina* plantation. Not hunted; the most common turaco in coastal forests from the Niger Delta to Lagos (PH).

Cuculidae

Oxylophus levaillantii Levaillant's Cuckoo. U. Dry season visitor or passage migrant; one seen 14 Feb 1988 (PH); one near J-4 Pond 27 Mar 2000 (AG).

Clamator glandarius Great Spotted Cuckoo. U. Old dry season records.

Cuculus solitarius Red-chested Cuckoo. C. Widespread in forest, heard calling Apr–Oct, but dry season presence requires confirmation.

C. clamosus Black Cuckoo. F. Widespread in forest in the wet season; possibly resident (PH).

C. gularis African Cuckoo. U. Dry season visitor; old records.

Cercococcyx olivinus Olive Long-tailed Cuckoo. RS, r. One, along the Erin Camp Nature Trail, 6 May 2000 (PH, AL).

Chrysococcyx cupreus African Emerald Cuckoo. A. Forest and *Gmelina* plantation, heard calling all the time.

C. klaas Klaas's Cuckoo. R. One, 14 Feb 1988 (PH); one near J-4 Pond, 15 Mar 2000 (AG).

C. caprius Didric Cuckoo. C. Secondary forest and *Gmelina* plantation.

Ceuthmochares aereus Yellowbill. C. Widespread in forest.

Centropus leucogaster Black-throated Coucal. F. Secondary forest undergrowth.

C. senegalensis Senegal Coucal. A. Farmland and *Gmelina* plantation. The dark morph is common (AG).

Strigidae

Bubo poensis Fraser's Eagle Owl. C. Often heard calling at Erin Camp and in the eastern J-4 Area dense forest, and once at J-4 Town on 9 Dec 2000 (AG).

Scotopelia bouvieri Vermiculated Fishing Owl. R. First seen by R. Oladepo of Akinlaja village on the Oni River, early Oct 2000; one flushed from a tree branch by the Oni River at Keno hunting camp, crossing the river into Ondo State 24 Nov 2000 (AG). May not be uncommon along rivers in the area. Three records near Lagos (Elgood *et al.* 1994); recorded from the banks of the Ogwe River, a tributary of the Niger near Agenbode (6°57'N, 6°35'E), a considerable distance east of Omo FR (Turk 2000); also found in the Niger delta (PH).

Strix woodfordii African Wood-Owl. C. Widespread, often heard calling at night.

Caprimulgidae

Caprimulgus climacurus Long-tailed Nightjar. C. Dry season visitor, seen on roads and open areas near villages in the J-4 Area. A large passage noted through J-4 Town and vicinity, 4–8 Dec 2000. Tail feathers grow to full length during Dec–Feb (AG).

Apodidae

Rhaphidura sabini Sabine's Spinetail. U. Twenty over Erin Camp, 22 Feb 1998 (PH).

Neafrapus cassini Cassin's Spinetail. F. Seen soaring over the forest canopy (PH).

Cypsiurus parvus African Palm Swift. U. Probably resident, but only noted during Jun–Aug 2000 at streams near villages in the *Gmelina* plantation (AG).

Apus apus Common Swift. U. Old dry season records, soaring over the forest canopy.

A. affinis Little Swift. A. Found at all large villages in the J-4 Area.

Alcedinidae

Halcyon badia Chocolate-backed Kingfisher. R. Found near streams in primary forest; one heard calling 8 Mar 1998 (PH).

H. leucocephala Grey-headed Kingfisher. C. Dry season visitor, Dec–Mar, at roadside streams in the *Gmelina* plantation (AG).

H. malimbica Blue-breasted Kingfisher. C. Forest and *Gmelina* plantation.

H. senegalensis Woodland Kingfisher. U. Seen at J-4 Pond, Dec 2000; old records.

Ceyx lecontei African Dwarf Kingfisher. U. Forest; one mist-netted 18 Apr 1997 (PH); old records.

C. pictus African Pygmy Kingfisher. C. Farmland and *Gmelina* plantation.

Alcedo leucogaster White-bellied Kingfisher. R. Forest streams; one mist-netted 18 Apr 1998 (PH). May be more common than this would suggest. Mist-netting in Korup NP, Cameroon showed it to be quite common there, although rarely observed (Rodewald *et al.* 1994).

A. cristata Malachite Kingfisher. F. A pair seen regularly at the J-4 Pond (AG).

A. quadribachys Shining-blue Kingfisher. U. Omo River and large streams.

Megaceryle maxima Giant Kingfisher. U. Omo River and large streams.

Ceryle rudis Pied Kingfisher. U. A pair at J-4 Town fish-farm ponds and also at J-4 Pond during Dec–May, but absent Jun–Nov (AG).

Meropidae

Merops gularis Black Bee-eater. F. Forest and *Gmelina* plantation, often seen at Omo River Bailey Bridge and in high trees on outskirts of J-4 Town.

M. pusillus Little Bee-eater. C. J-4 Town outskirts and J-4 Area farmlands.

M. albicollis White-throated Bee-eater. U. Passage migrant or dry season visitor. A flock at J-4 Town, 8–12 Dec 2000 (AG); old records.

Coraciidae

Eurystomus gularis Blue-throated Roller. U. Forest edge and clearings; four, 14 Feb 1988 (PH); a pair along the upper Omo River near the Biosphere Reserve, mid-Jul 2000 (AG).

E. glaucurus Broad-billed Roller. C. Dry season visitor during Nov–Jun along the Omo River, in *Gmelina* plantation and in farmland (AG).

Phoeniculidae

Phoeniculus castaneiceps Forest Wood-hoopoe. U. Forest; old records.

Bucerotidae

Tropicranus albocristatus White-crested Hornbill. F. Found in dense foliage in forest.

Tockus camurus Red-billed Dwarf Hornbill. C. Forest; the laughing call of small groups heard daily.

T. fasciatus African Pied Hornbill. F. Widespread in Omo FR.

Bycanistes fistulator Piping Hornbill. F. Forest edge and secondary forest.

B. subcylindricus, Black-and-white-casqued Hornbill. U. Forest canopy; forest edge.

B. albotibialis White-thighed Hornbill. C. Forest canopy.

Ceratogymna atrata Black-casqued Hornbill. U. Forest canopy, the least common hornbill in Omo FR. Elgood *et al.* (1994) indicated that it was not to be found west of Benin City, but it is very common in Okomu NP (6°25'N, 5°20'E), 100 km southeast of Omo FR, with upwards of 10 recorded daily (PH).

Capitonidae

Gymnobucco calvus Naked-faced Barbet. C. Noisy groups in secondary forest.
Pogoniulus scolopaceus Speckled Tinkerbird. C. Widespread, foraging in lower stratum of dense forest.

P. atroflavus Red-rumped Tinkerbird. F. Usually found foraging high in forest trees, heard calling daily.

P. subsulphureus Yellow-throated Tinkerbird. C. Widespread, more common in dense forest than in cacao plantations and farmlands.

P. bilineatus Yellow-rumped Tinkerbird. C. Widespread, more common in overgrown farmlands and cacao plantations than in dense forest.

Buccanodon duchaillui Yellow-spotted Barbet. C. Forest canopy.

Tricholaema hirsuta Hairy-breasted Barbet. C. Forest canopy; its distinctive call heard daily in the vicinity of Erin Camp (AG).

Indicatoridae

Indicator maculatus Spotted Honeyguide. R. One, Erin Camp, 16 Mar 2000 (photographed, AL, PH, AG), the first record for Omo FR. Elgood *et al.* (1994) considered it a rare resident in Nigeria (one collected east of Omo FR in Ondo State, another netted to the west near Lagos at Badagry).

Picidae

Campethera nivosus Buff-spotted Woodpecker. F. Forest understorey, noted especially in cacao plantations along the Omo River and at Erin Camp (AG).

Dendropicos fuscescens Cardinal Woodpecker. R. One observed for several minutes at close range in overgrown farmland near J-4 Town 9 Sep 2000 (AG).

D. pyrrhogaster Fire-bellied Woodpecker. C. Widespread, the most common woodpecker in the reserve.

Eurylaimidae

Smithornis rufolateralis Rufous-sided Broadbill. R. Forest; one heard, 8 Mar 1998 (PH).

Pittidae

Pitta angolensis African Pitta. R. Forest floor; old records. Considered a rare rainforest resident by Elgood *et al.* (1994).

Hirundinidae

Hirundo semirufa Rufous-chested Swallow. A. Rainy season visitor, May–Oct, villages and farmlands of J-4 Area. A pair nested under the eaves of AG's house, J-4 Town, late May 2000.

H. senegalensis Mosque Swallow. C. Dry season visitor, Dec–May, J-4 Town and Abeku.

H. smithii Wire-tailed Swallow. R. One at J-4 Town for a few days in mid-May and then a pair there on 26 May 2000 (AG).

H. aethiopica Ethiopian Swallow. A. Found in J-4 Town and other large villages in the J-4 Area, nesting in houses, schools and other buildings (AG).

H. rustica Barn Swallow. C. Dry season visitor, Oct–Apr, villages and farmlands of J-4 Area.

Motacillidae

Motacilla flava Yellow Wagtail. A. Dry season visitor, Nov–Mar, to villages and farmlands of the J-4 Area, coming into breeding plumage in early Mar.

M. aguimp African Pied Wagtail. C. Rainy season visitor, May–Oct 2000, J-4 Town (AG).

Anthus leucophrys Plain-backed Pipit. F. Dry season visitor, Dec–May, to school grounds and football fields at J-4 Town and to the east at Oloji Village (AG).

A. trivialis Tree Pipit. F. Passage migrant; one at J-4 Town 28 Mar 2000 and many there 13–18 Nov 2000 (AG).

Macronyx croceus Yellow-throated Long-claw. C. Found in tall grass at J-4 Town near the football field, the sawmill office, and around J-4 Pond (AG).

Pycnonotidae

Andropadus virens Little Greenbul. A. Widespread in a variety of habitats.

A. curvirostris Cameroon Sombre Greenbul. C. Lower stratum of forest.

A. gracilirostris Slender-billed Greenbul. C. Forest canopy (common at Erin Camp) and tall trees in farmland.

A. latirostris Yellow-whiskered Greenbul. C. Secondary forest, forest edge, and abandoned farmland with underbrush.

Ixonotus guttatus Spotted Greenbul. C. Widespread, in large noisy groups.

Thescelocichla leucopleura Swamp Palm Bulbul. F. A group was resident in a patch of forest near the J-4 Pond during 2000–1 (AG).

Phyllastrephus icterinus Icterine Greenbul. U. Lower stratum of forest; three mist-netted at Erin Camp 18 Apr 1997, and netted there again 8 Mar 1998 (PH).

Bleda syndactyla Red-tailed Bristlebill. U. Forest undergrowth.

B. canicapilla Grey-headed Bristlebill. F. Forest undergrowth and forest edge.

Criniger barbatus Western Bearded Greenbul. C. Lower stratum of forest, heard calling throughout the day.

C. calurus Red-tailed Greenbul. C. Widespread in low and middle strata of the forest.

Pycnonotus barbatus Common Bulbul. A. Widespread in all habitats.

Nicator chloris Western Nicator. C. Brushy tangles in forest.

Turdidae

Stiphrornis erythrothorax Forest Robin. F. Forest floor and undergrowth.

Alethe diademata Fire-crested Alethe. F. Forest floor.

A. poliocephala Brown-chested Alethe. F. Forest floor.

Neocossyphus poensis White-tailed Ant Thrush. F. Forest floor and undergrowth.

Saxicola rubetra Whinchat. C. Passage migrant in J-4 farmland; first noted on 5 Mar, then found to be common (several per day) during 14–18 Mar 2000 (AG).

Myrmecocichla albifrons White-fronted Black Chat. R. One seen in cultivation 14 Feb 1988 (PH); also known from the Lekke Peninsula between Omo FR and Lagos (PH).

Zoothera princei Grey Ground Thrush. R. Forest floor; first sighting near Erin Camp 9 Mar 1997 and subsequently mist-netted there 17 Apr 1997 (PH). Elgood *et al.*

(1994) mention only one sight record (early 1950s) for Nigeria. Thomas (1991) netted one just over the Cameroon border in Korup NP.

Turdus pelios African Thrush. U. Farmlands of the J-4 Area.

Sylviidae

Hippolais polyglotta Melodious Warbler. U. Dry season visitor in farmlands.

Cisticola anonymus Chattering Cisticola. C. Tall grass around villages and farms.

Prinia subflava Tawny-flanked Prinia. C. Farmlands, brushy areas and villages.

Apalis nigriceps Black-capped Apalis. R. Forest canopy; a pair seen 8 Mar 1998 (PH).

A. rufogularis Buff-throated Apalis. F. Forest canopy and amongst lianas.

Camaroptera brachyura Grey-backed Camaroptera. C. Brushy areas in farmland and secondary forest edge.

C. superciliaris Yellow-browed Camaroptera. C. Forest, often seen near Erin Camp in secondary growth.

C. chloronota Olive-green Camaroptera. R. Two mist-netted 14 Feb 1988 (PH).

Macrosphenus concolor Grey Longbill. C. Forest, in dense tangles and brush.

Sylvietta virens Green Crombec. C. Forest edge and brushy areas.

Phylloscopus trochilus Willow Warbler. C. Dry season visitor noted at J-4 Town during Jan-Feb 2000 (AG).

P. sibilatrix Wood Warbler. U. Dry season visitor to forest edge.

Hylia prasina Green Hylia. C. Forest and forest patches on outskirts of J-4 Town.

Muscicapidae

Fraseria ocreata Fraser's Forest Flycatcher. F. Forest edge and forest clearings.

F. cinerascens White-browed Forest Flycatcher. R. First recorded 16 Mar 2000 at forest edge on the bank of the Omo River (PH, AL & AG).

Muscicapa striata Spotted Flycatcher. F. Passage migrant Mar–May and Sep–Nov, often seen at Omo River Bailey Bridge and around J-4 Town; also several birds in J-4 Town and at J-4 Pond 26 Dec 2000 (AG).

M. cassini Cassin's Flycatcher. C. Riverbanks of Omo and Oni rivers and along the lower Erija Stream (J-3 Area).

Myioparus plumbeus Lead-coloured Flycatcher. U. Overgrown farmlands of J-4 Area (AG).

Ficedula hypoleuca Pied Flycatcher. PM, u. Dry season visitor to overgrown farmlands of the J-4 Area (AG).

Monarchidae

Erythrocercus mccallii Chestnut-capped Flycatcher. C. Forest mid-stratum and edge.

Elminia nigromitrata Dusky Crested Flycatcher. U. Forest undergrowth; one mist-netted 18 Apr 1997 (PH).

Trochocercus nitens Blue-headed Crested Flycatcher. F. Forest undergrowth and amongst lianas in forest mid-stratum.

Terpsiphone viridis African Paradise-Flycatcher. U. Dry season visitor (white-tailed birds) in the *Gmelina* plantation during Dec–Apr (AG).

T. rufiventer Red-bellied Paradise-Flycatcher. A. Widespread in groups (rufous-backed race) in secondary forest and at forest edge.

Platysteiridae

Dyaphorophya castanea Chestnut Wattle-eye. C. Widespread in forest mid-stratum, often encountered near Erin Camp.

Platysteira cyanea Common Wattle-eye. C. J-4 Town, J-4 Area farmlands and in forest at Olutasi village, 15 km west of J-4 Town on the Omo River (AG).

Timaliidae

Illadopsis rufipennis Pale-breasted Illadopsis. C. Forest lower stratum and forest floor; the distinctive call heard all day.

I. fulvescens Brown Illadopsis. F. Forest undergrowth and thickets.

Remizidae

Pholidornis rushiae Tit-hylia. F. Forest canopy.

Nectariniidae

Deleornis fraseri Fraser's Sunbird. U. Forest lower and mid-strata.

Cyanomitra cyanolaema Blue-throated Brown Sunbird. F. Forest canopy and edge.

C. obscura Western Olive Sunbird. C. Forest mid-stratum and in tall trees on the outskirts of J-4 Town.

Chalcomitra adelberti Buff-throated Sunbird. F. Forest edge and clearings (often seen at Erin Camp) and J-4 Town gardens.

Hedydipna collaris Collared Sunbird. C. Secondary forest, forest edge, farmland and J-4 Town gardens.

Cinnyris chloropygius Olive-bellied Sunbird. A. Forest, forest edge and village gardens (the most common sunbird in J-4 Town).

C. superbus Superb Sunbird. C. Forest edge, forest clearings and J-4 Town.

C. batesi Bates's Sunbird. R. Forest canopy; also a pair at forest edge near J-4 Pond 13 Nov 2000 (AG).

Zosteropidae

Zosterops senegalensis Yellow White-eye. F. Farmlands near J-4 Town.

Malaconotidae

Dryoscopus sabini Sabine's Puffback. U. Forest upper stratum.

D. gambensis Northern Puffback. R. One seen in Jan 2000 (AG with Manu Shiiwua) near Erin Camp, a short distance from extensive farmland at a hunting camp (AG).

Oriolidae

Oriolus nigripennis Black-winged Oriole. C. Forest canopy, especially in secondary forest.

O. brachyrhynchus Western Black-headed Oriole. C. Forest canopy, especially in undisturbed forest.

Dicruridae

Dicrurus atripennis Shining Drongo. U. Mid-stratum of the forest interior.

D. modestus Velvet-mantled Drongo. R. One seen 14 Feb 1988 (PH).

Corvidae

Corvus albus Pied Crow. C/U. Common resident only along the E-W Expressway. Very uncommon at J-4 Town in the dry season, becoming frequent Jul-Sep, then absent Oct-Nov, reappearing in Dec; also recorded at Abeku, Dec 2000 (AG).

Sturnidae

Lamprolornis purpureiceps Purple-headed Glossy Starling. U. Forest canopy.

L. splendidus Splendid Glossy Starling. F. Flocks in high trees in J-4 Area villages and farmlands and in forest canopy along the Omo River.

Cinnyricinclus leucogaster Violet-backed Starling. C. Dry season visitor to open areas of the reserve; especially noted in J-4 Town during Jan–Feb 2000 (AG).

Passeridae

Passer griseus Northern Grey-headed Sparrow. A. J-4 Town and large villages in the Gmelina plantation; absent from smaller villages surrounded closely by forest.

Ploceidae

Ploceus nigricollis Black-necked Weaver. C. Forest edge; a pair often seen in the forest patch near J-4 Pond (AG).

P. nigerrimus Vieillot's Black Weaver. A. Towns, villages, farmlands and along J-4 Area streams, frequently nesting in tall oil palms with Village Weavers. Black and chestnut race *castaneofuscus* readily distinguished from *P. albinuchas*, which in the study area is all black.

P. cucullatus Village Weaver. A. Villages and towns in the J-4 Area.

P. tricolor Yellow-mantled Weaver. F. Forest upper stratum and forest edge.

P. albinuchas Maxwell's Black Weaver. U. Forest canopy. A flock seen building nests in a tall *Ceiba pentandra* tree along the J-3 logging track, 30 Aug 2000 (AG). Fairly common 100 km southeast of Omo FR in Okomu NP (PH).

P. superciliosus Compact Weaver. C. Pairs at several locations around J-4 Town (AG).

Malimbus nitens Blue-billed Malimbe. A. Found along streams in the Gmelina plantation, especially in farmlands. A flock building new nests in *Raphia* palms at J-4 Pond, Jun–Jul 2000, remained near the old nests during the dry season (AG).

M. malimbicus Crested Malimbe. F. Primary forest in mid-stratum, forest edge, and in logged (secondary) forest.

M. scutatus Red-vented Malimbe. F. Forest canopy at forest edge.

M. rubricollis Red-headed Malimbe. C. Forest and also in wooded areas of farmland; a flock building nests in a tree outside Abeku, Dec 2000 (AG).

Estrildidae

Parmoptila woodhousei Red-headed Antpecker. R. Undergrowth near swampy forest streams; a pair mist-netted 8 Mar 1998 (PH).

Nigrita canicapillus Grey-crowned Negrofinch. C. Forest, mostly in canopy.

N. luteifrons Pale-fronted Negrofinch. F. Forest edge and secondary growth.

N. bicolor Chestnut-breasted Negrofinch. C. Forest, plantation and farmland.

Spermophaga haematina Western Bluebill. F. Forest, especially in undergrowth.

Estrilda melpoda Orange-cheeked Waxbill. A. Tall grass at J-4 Town and in farmlands throughout the J-4 Area.

Lonchura cucullata Bronze Mannikin. A. Villages and farmlands.

L. bicolor Black-and-white Mannikin. C. Villages and farmlands.

Viduidae

Vidua macroura Pin-tailed Whydah. A. Farmlands and villages, changing into breeding plumage during Apr–May 2000 and changing back in Nov 2000 (AG).

Discussion

Of the 20 Palaearctic migrants, ten are passerines. Twenty-six species are either intra-African migrants or exhibit local movements, and seven of these are passerines.

Excepting Green-backed Heron, other herons and egrets are uncommon in Omo FR. The occasional Palaearctic heron turned up at J-4 Pond during the dry season, and some Palaearctic shorebirds also stopped off there from mid-dry season onward (pond water levels were too high to provide a muddy shoreline earlier).

Five common resident raptors are Palm-nut Vulture, Harrier-hawk, West African Goshawk, Lizard Buzzard, and Crowned Eagle. Most other hawks and eagles on the list above are either uncommon or rare.

Prior to 2000, most birding visitors to the reserve were only interested in “forest” species, and paid little or no attention to open country birds. This could explain why more of the open country species have not yet been listed.

Acknowledgments

We express our appreciation to the Nigerian Forest Elephant Group and the Department of Forestry in the Ogun State Ministry of Agriculture for assistance and support given during the collection of these data. Thanks go to J. Frank Walsh who commented on an earlier draft and to the referees who provided many suggestions for improvements of this paper.

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Nouvelles données sur la reproduction et l'hivernage des Flamants roses *Phoenicopterus roseus* en Mauritanie et confirmation d'échanges avec les colonies méditerranéennes

par Y. Diawara¹, A. Arnaud², A. Araujo¹ & A. Béchet²

¹ Parc National du Banc d'Arguin, BP 5355 Nouakchott,
République Islamique de Mauritanie. <ydiawara00@yahoo.fr>

² Station Biologique de la Tour du Valat, le Sambuc, 13 200 Arles, France

Reçu 14 mars 2006; revu 7 novembre 2006.

Résumé

Le Flamant rose *Phoenicopterus roseus* se reproduit en Méditerranéenne et sur les zones humides côtières de Mauritanie, où il est souvent abondant. Le lien entre les Flamants roses se reproduisant en Mauritanie et les colonies de Méditerranée n'était cependant pas solidement établi. Nous avons suivi les Flamants roses des zones humides côtières de Mauritanie en 2003–4, en utilisant des photographies aériennes et des lectures de bagues PVC à la colonie, avec une cache mobile. Nous mettons les premiers résultats de cette étude en perspective avec les données des 48 dernières années relatives à cette espèce en Mauritanie. L'observation de deux oiseaux nés et bagués en Méditerranée, nourrissant des poussins sur le Banc d'Arguin prouve qu'il existe des échanges entre les colonies méditerranéennes et mauritanienne. Nous discutons des implications de ces résultats pour les limites de la métapopulation de cette espèce.

Summary

New data on the breeding and wintering of Greater Flamingos *Phoenicopterus roseus* in Mauritania and confirmation of exchanges with Mediterranean colonies. The Greater Flamingo *Phoenicopterus roseus* breeds in the Mediterranean and in the coastal wetlands of Mauritania, where it is often abundant. However, the link between the birds breeding in these two areas remained unclear. We monitored Greater Flamingos in the coastal wetlands of Mauritania in 2003–4, using flight surveys and sightings of PVC-banded birds, with a mobile hide. We put the first results of this study in the perspective of the 48 years' data on this species in Mauritania. The observation of two birds, which were hatched and ringed in the Mediterranean, feeding chicks on the Banc d'Arguin, proves exchange between the Mediterranean and Mauritanian colonies. We discuss the implications of these results for the limits of the metapopulation of this species.

Introduction

Le Flamant rose *Phoenicopterus roseus* est une des nombreuses espèces fréquentant les zones humides côtières mauritaniennes. Il est observé toute l'année, du banc d'Arguin jusqu'à l'Aftout es Saheli, le Chatt Boul et le Parc National du Diawling dans le delta du fleuve Sénégal. La reproduction de cette espèce en Mauritanie a été mise en évidence à plusieurs reprises mais sa fréquence reste mal connue (Trotignon 1976, Campredon 1987, Cézilly *et al.* 1994, Gowthorpe *et al.* 1996) et n'a pas fait l'objet d'une synthèse récente.

Dans les années 1970, les flamants hivernaient en grand nombre au banc d'Arguin (Trotignon *et al.* 1980, Trotignon & Trotignon 1981). Depuis la fin des années 50, il semble que la reproduction y ait été assez régulière malgré d'importantes variations d'effectifs et de sites de reproduction (Gowthorpe *et al.* 1996). Les flamants ont été signalés occupant tour à tour l'îlot des Flamants, les îles Petite et Grande Kiaone et l'îlot des Pélicans. Alors que la reproduction des flamants sur l'îlot des Flamants, ou dans l'Aftout es Saheli peut ressembler à celle observée en Méditerranée (îlots plats, nids de boue surélevés), la disposition des flamants en reproduction sur les Kiaone est unique au monde. La colonie est installée sur une île de plus de 12 m au-dessus du niveau de la mer. Les oeufs sont déposés sur des éboulis ou même sur le plateau grésocalcaire de l'île (Campredon 1987, Gowthorpe *et al.* 1996). Deux à trois semaines après l'éclosion, une bonne partie de la crèche descend les parois du plateau et se rassemble sur un banc de sable au pied de l'île. D'autres restent au sommet jusqu'à l'envol.

Depuis la création du Parc National du Diawling (PND) et de la réserve naturelle du Chatt Boul au sud de l'Aftout es Saheli, quelques milliers de Flamants roses sont observés chaque année en hiver, y compris des juvéniles de l'année qui sont observés surtout entre octobre et mars (Hamerlynck 1996). La reproduction n'y a été observée qu'en période hivernale à la fin des années 80, suite à des précipitations intenses ayant conduit à la rupture du cordon dunaire au sud du Chatt Boul, inondant massivement l'Aftout es Saheli (Gowthorpe *et al.* 1996).

Depuis 1977, un programme de baguage annuel des Flamants roses avec des bagues colorées a été mis en place en Camargue dans le sud de la France (Johnson 2000). Cette opération a également lieu en Espagne depuis 1986 (Rendón *et al.* 2001). Des Flamants roses bagués dans ces deux pays ont été observés régulièrement au Banc d'Arguin en toute saison depuis 1978 (Trotignon & Trotignon 1981, Johnson 1989). Ces observations ont conduit à émettre l'hypothèse qu'il existe des échanges génétiques entre les flamants nés en Méditerranée et ceux nés en Mauritanie. En particulier, des flamants nés et bagués en Méditerranée pourraient se reproduire en Mauritanie. Ceci pourrait correspondre aussi bien à de la dispersion juvénile (flamants se reproduisant pour la première fois ailleurs que sur le lieu de naissance) qu'à de la dispersion d'adultes (flamants s'étant reproduits en Méditerranée auparavant). En 1986, A. Johnson (com. pers.) a fortement soupçonné un flamant né et bagué en France d'être nicheur sur l'îlot des Flamants. En février 1988, J.L. Lucchesi (com.

pers.) apportait la première preuve que des flamants méditerranéens se reproduisaient au sud de la Mauritanie en reportant l'observation de deux femelles de flamants nées et baguées en France nourrissant des poussins dans l'Aftout es Saheli. Jusqu'à ce jour, la difficulté d'accès aux colonies de Flamants roses en Mauritanie n'avait pas permis de confirmer la généralité de ces observations. Si l'hypothèse d'échanges entre ces deux populations se confirme, cela devra être pris en compte lors de l'élaboration d'un plan pour la conservation de cette espèce afin que celui-ci s'applique à l'ensemble de l'aire de distribution de la métapopulation.

Cet article vise en premier lieu à présenter une mise à jour synthétique des effectifs reproducteurs et hivernants de Flamants roses en Mauritanie de 1957 à 2004, et ensuite à évaluer la validité de l'hypothèse d'une dispersion des flamants méditerranéens en Mauritanie suite à deux campagnes d'observation de la principale colonie nicheuse de flamants dans ce pays.

Aire d'étude

Le Parc National du Banc d'Arguin (PNBA), situé de part et d'autre du 20ème parallèle, longe le littoral mauritanien sur plus de 180 km et couvre une superficie de 12000 km² composée à parts égales de zones maritimes et terrestres (Fig. 1). Le Banc d'Arguin est une zone marine très peu profonde (5 m d'eau à 50 km de la côte) traversée de chenaux et couverte d'herbiers submergés. Cet écosystème côtier exceptionnel est baigné par des remontées d'eaux profondes, froides et riches en éléments nutritifs ("upwelling"). La présence simultanée des herbiers et d'un upwelling important engendre une productivité biologique élevée qui explique la présence de populations denses d'oiseaux d'eau, de poissons, d'invertébrés et de mammifères marins.

Au sud, les zones humides côtières de la Mauritanie se concentrent autour du delta du fleuve Sénégal entre 16°2' et 16°35'N (Fig. 1). Jusqu'à récemment, ce système deltaïque était alternativement inondé par des eaux marines et des eaux douces favorisant le développement d'une diversité biologique extrêmement abondante (Hamerlynck 1996). A partir des années 70, la dégradation des conditions pluviométriques et les aménagements de la vallée du fleuve Sénégal ont considérablement dégradé ces écosystèmes. Pour atténuer les impacts de ces aménagements, la conservation d'une portion du bas delta dans la partie mauritanienne a été recommandée depuis 1980, conduisant à la création du Parc National du Diawling (PND) en 1991 et de la réserve du Chatt Boul.

Méthodes

La recherche et le décompte des Flamants roses ont été menés lors de trois survols, selon des transects prédéfinis visant à couvrir l'ensemble du Parc National du Banc

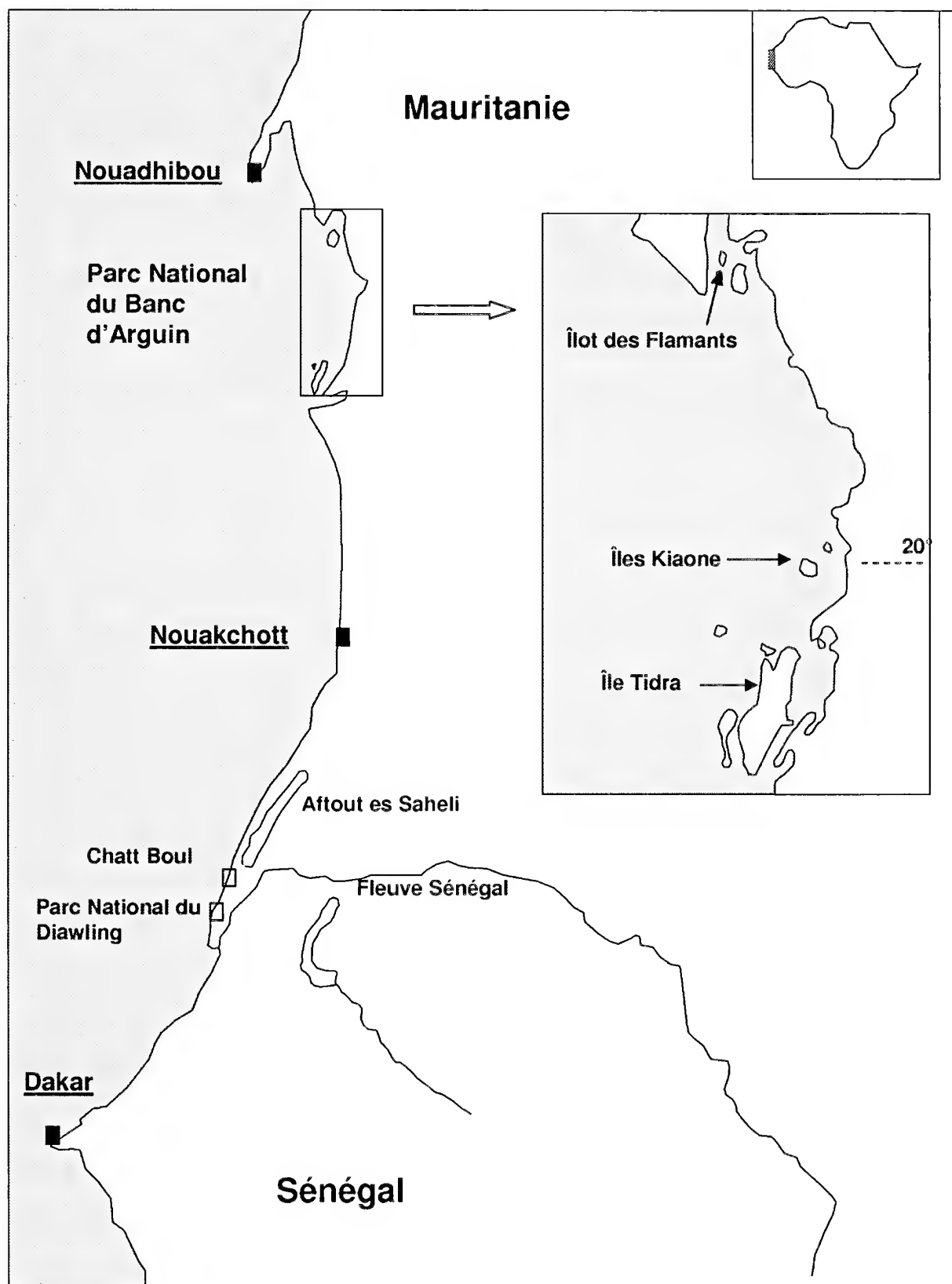


Figure 1. Les principales zones humides côtières fréquentées par les flamants en Mauritanie : du Nord au Sud, le Parc National du Banc d'Arguin, l'Aftout es Saheli, le Chatt Boul et le Parc National du Diawling.

d'Arguin ou du delta du fleuve Sénégal selon les cas. Les survols du Banc d'Arguin ont eu lieu le 26 avril 2003 et le 7 mai 2004. Le survol du delta du fleuve Sénégal a eu lieu le 15 décembre 2003 suite à une période de fortes précipitations. Lors de ces survols, le nombre de flamants était estimé visuellement. Des photos ont été prises à l'aide d'un appareil reflex 24 x 36 avec un zoom 50–70 mm à la verticale de l'île de la Grande Kiaone où fut identifiée la seule colonie reproductrice. Les flamants sur les nids et les poussins dans la crèche ont été décomptés sur des agrandissements 75 x 50 cm de ces photos à l'aide d'un stylo avec compteur intégré.

La présence de flamants nés en Méditerranée a été évaluée par la recherche et l'observation de flamants bagués avec des bagues PVC colorées présentant un code alphanumérique unique (synthèse dans Johnson 2000; liste des bagues posées à http://www.framingoatlas.org/dwld_bandsummaries.php). Les bagues sont lisibles à 300 m avec des télescopes grossissant 60 x. Les observations à la colonie de la Grande Kiaone ont été menées respectivement 26–30 mai 2003, 12–16 août 2003 et 2–6 juin 2004. Les îles Kiaone étaient atteintes après 1–2 heures de lanche (embarcation de pêche à voile) conduite par des pêcheurs. Ensuite, les observations étaient faites en avançant à pied dans une cache mobile (un parallélépipède rectangle d'1 m de large et d'1.70 m de hauteur constituée d'une armature d'aluminium recouverte de toile de jute) à c. 300 m de la crèche sur un banc de sable découvert pendant 2–3 h à marée basse. Les périodes d'observation étaient caractérisées par des grandes marées et des basses eaux de fin d'après-midi, pour coïncider avec le retour crépusculaire des adultes pour nourrir les jeunes à la crèche (Cézilly *et al.* 1994). L'âge moyen des poussins a été estimé d'après A. Johnson (données non publiées).

Résultats

Reproduction

Les Flamants roses se sont reproduits assez régulièrement au banc d'Arguin depuis 1957 malgré l'absence de données pour 17 des 48 années considérées (Fig. 2, données de Naurois 1969, Westernhagen 1970, Mahé 1985, Campredon 1987, Wetten *et al.* 1990, Cézilly *et al.* 1994, Gowthorpe *et al.* 1996, notre étude). Si la reproduction des flamants a été signalée dès 1957 sur la Grande Kiaone (Tixerant *in* Naurois 1969), elle était surtout concentrée sur l'îlot des Flamants jusqu'en 1989. A partir de cette date, l'îlot des Flamants est abandonné au profit des Kiaone. Seuls des œufs ont été observés à deux reprises sur l'îlot des Pélicans en 1959 et 1974 (Trotignon 1976).

Les survols menés aux printemps 2003 et 2004 ont confirmé la reproduction des flamants sur la Grande Kiaone. Par contre, l'îlot des Flamants et l'îlot des Pélicans n'ont pas été occupés ces deux années (Fig. 2). En 2003, la photo aérienne du 26 avril a permis d'estimer un total de 8200 couples nicheurs sur la Grande Kiaone. Nos observations menées du 12 au 17 août juste avant l'envol des premiers juvéniles nous ont permis de dénombrer 3600 poussins. On peut donc estimer le succès de la

reproduction à près de 44 %. En 2004, le survol a été mené le 7 mai et il ne restait plus d'adulte sur les nids. La crèche, dénombrée sur une photo aérienne, comptait 5800 poussins. Lors du survol, nous avons compté un total de 19000 flamants de la baie d'Arguin jusqu'au sud de Tidra (Fig. 1). Il y avait donc un maximum de 9500 couples nicheurs cette année. Le succès de la reproduction est donc estimé à 61 %.

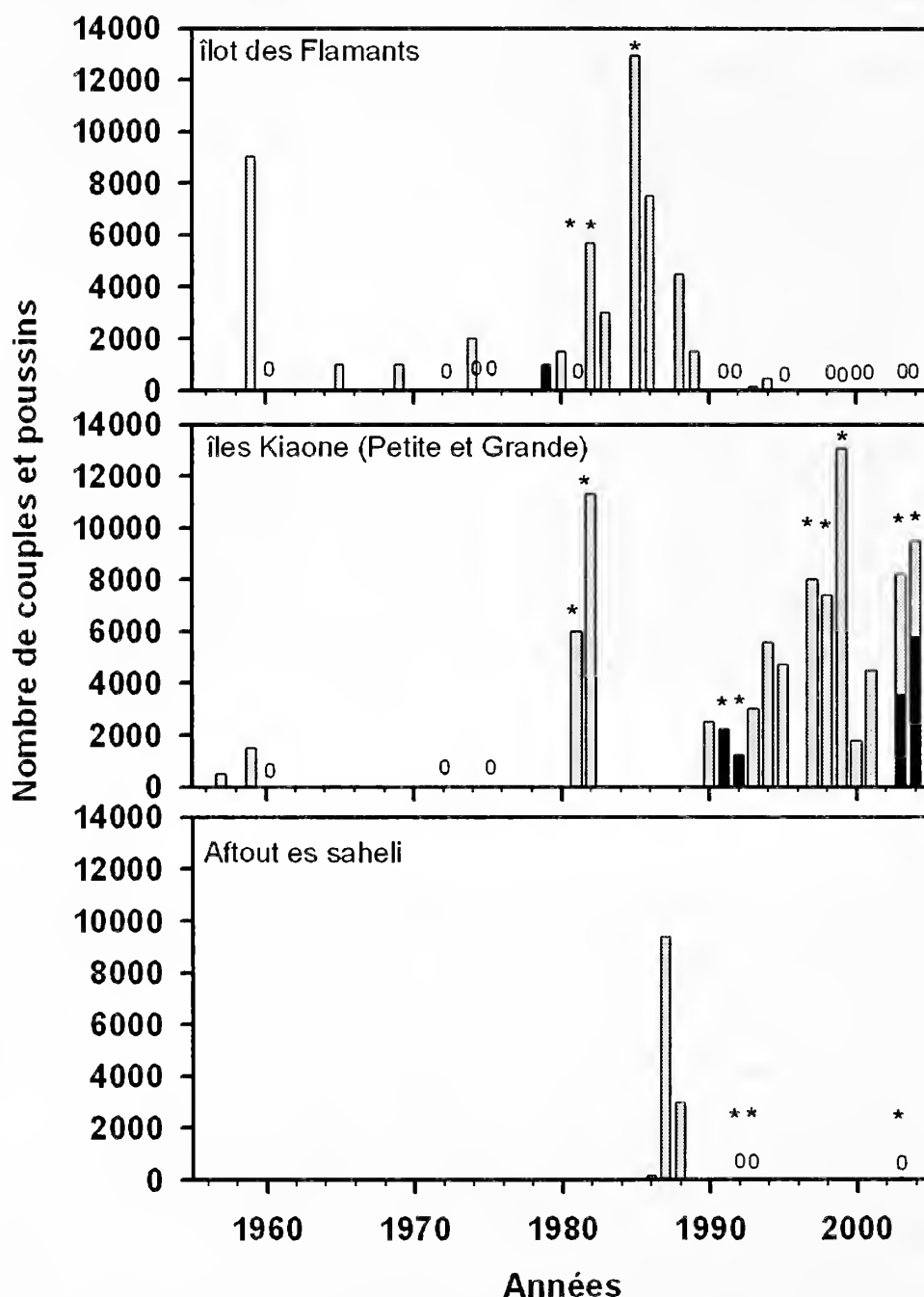


Figure 2. Nombre de couples reproducteurs (gris) et nombre de poussins à l'envol (noir) dénombrés sur quatre localités côtières, 1957–2004. Les étoiles marquent les dénombrements aériens. Les années sans estimation sont des années sans dénombrement; les années notées avec un 0 sont des années sans reproduction.

Nous n'avons trouvé la trace que de trois événements de reproduction dans l'Aftout es Saheli, en 1986 (quelques centaines de couples), 1987 et 1988 (Fig. 2 ; J.C. Lucchesi com. pers.). Le site de reproduction était situé à Tiguent au sud du seuil de Gouéichichit (17°15'N, 16°0'W) (Wetten *et al.* 1990, Gowthorpe *et al.* 1996). Aucune trace de reproduction des flamants n'a pu être trouvée lors du survol du delta du fleuve Sénégal (Aftout es Saheli, PND et Chatt Boul inclus) le 15 déc 2003.

Hivernage

Les Flamants roses sont particulièrement abondants en hivernage au banc d'Arguin où 60000 individus étaient dénombrés en 1978–9 (Trotignon *et al.* 1980, Trotignon & Trotignon 1981). Malgré une baisse notable au milieu des années 80 (Gowthorpe *et al.* 1996), les effectifs semblent remonter aujourd'hui avec plus de 35000 individus en 1997, 49170 individus en 2000 et 55160 individus en 2001 (Dodman *et al.* 1998, Messaoud *et al.* 2003). Nous avons dénombré un total de 12965 flamants dans le delta du fleuve Sénégal en décembre 2003, dont 2700 étaient des juvéniles de l'année d'origine inconnue. Ces juvéniles étaient particulièrement abondants dans l'Aftout es Saheli (c. 2000) et le reste fut dénombré dans le bassin de Bell au Diawling. Ces observations permettent de compléter la série de données pour le PND et le Chatt Boul (Fig. 3).

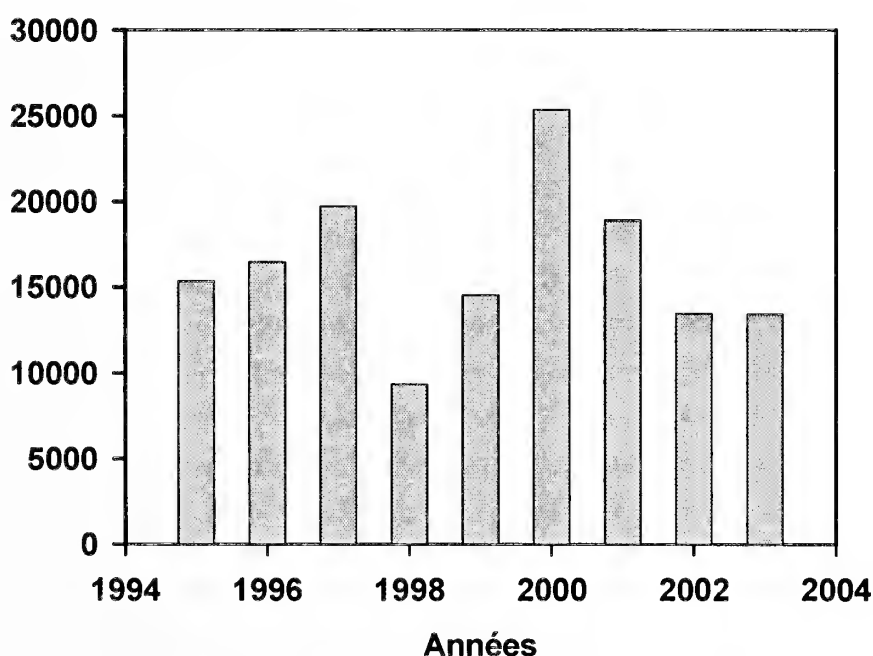


Figure 3. Effectifs de Flamants roses recensés à la mi-janvier dans le Parc National du Diawling et dans le Chatt Boul, 1995–2003.

Lien entre la population méditerranéenne et mauritanienne

En 2003, nous avons lu un total de 28 bagues au pied de la Grande Kiaone pour un total de 25,5 h d'observation réparties sur 7 jours. Des 16 bagues différentes lues, 11

étaient d'origine espagnole, quatre d'origine française et une d'origine italienne. Parmi ces observations, un flamant d'origine inconnue, bagué adulte en Espagne (Tableau 1) a été observé nourrissant un poussin. Basé sur l'âge moyen des poussins observés à la crèche, nous estimons que le pic de ponte a eu lieu entre le 10 et le 15 mars 2003.

Tableau 1. Historique des flamants bagués à l'étranger et observés reproducteurs sur l'île de la Grande Kiaone, Parc National du Banc d'Arguin, Mauritanie, en 2003–4.

No. de bague	Détails de baguage (lieu, date, age, sexe)	Date d' observation	Lieu d'observation	Comportement
8 R6	Laguna de Fuente de Piedra (Espagne) 15 août 1998 age > 1 an, mâle	16 nov 1998 30 nov 1998 26 mai 2003 27 mai 2003	Villafranco del Guadalquivir (Espagne) Veta la Palma (Espagne) Grande Kiaone (Mauritanie) Grande Kiaone (Mauritanie)	À la colonie Nourrit un poussin
0 ADRL	Laguna de Fuente de Piedra (Espagne) 23 août 1997 poussin, femelle	9 avr 2002 24 juil 2002 2 mai 2004	Laguna de Fuente de Piedra (Espagne) Veta la Palma (Espagne) Grande Kiaone (Mauritanie)	Parade Nourrit un poussin
CJLJ	Etang du Fangassier (France), 7 août 1996 poussin, mâle	26 août 1996 28 juin 2000 4 mai 2004	Etang du Fangassier (France) Stagno di Molentargius (Italie) Grande Kiaone (Mauritanie)	A la colonie A la colonie Nourrit un poussin

En 2004, nous avons lu 29 bagues pour 27,5h d'observation réparties sur 5 jours. Vingt d'entre-elles étaient d'origine espagnole et neuf d'origine française. Seuls trois flamants bagués avaient déjà été observés l'année précédente (deux français et un espagnol). Parmi ces observations, deux flamants nés et bagués en Méditerranée (un en Espagne et un en France) ont été observés nourrissant des poussins dans la colonie de la grande Kiaone au Banc d'Arguin (Tableau 1). Ces flamants, un mâle et une femelle âgés respectivement de 8 et 7 ans n'avaient jamais été observés reproducteurs auparavant. Compte-tenu de l'âge moyen des poussins observés à la crèche, nous estimons que le pic de ponte a eu lieu entre le 1 et le 10 mars 2004.

Discussion

Les effectifs reproducteurs de Flamants roses en Mauritanie sont marqués par l'abandon du site de reproduction de l'îlot des Flamants au profit des îles Kiaone à la fin des années 80. C'est sans doute suite à la submersion plus fréquente de l'îlot des

Flamants, submersion déjà signalée par Naurois (1969), que les flamants ont utilisé la Petite et la Grande Kiaone de façon régulière. Cette perturbation naturelle a provoqué une baisse temporaire des effectifs reproducteurs au début des années 90, ceux-ci revenant aujourd'hui à leur valeur des années 80 avec près de 10000 couples dénombrés. Il nous faut donc actualiser la dernière tendance publiée (Gowthorpe *et al.* 1996) et conclure que la population nicheuse des flamants roses en Mauritanie est aujourd'hui stable. A l'exception de quatre années sans suivi (1984, 1987, 1996, 2002), les flamants ont tenté de se reproduire au Banc d'Arguin chaque printemps durant ces 26 dernières années. Néanmoins, on ne sait que rarement si les tentatives de reproduction ont produit des poussins à l'envol et si ce fut le cas, quel en était l'effectif.

En 2003 et 2004, le pic de ponte a eu lieu plus d'un mois plus tôt qu'en 1991 et 1992 (Cézilly *et al.* 1994) démontrant la variabilité des dates d'installation des flamants au Banc d'Arguin. La saison de reproduction observée est synchrone avec les saisons de reproduction en Méditerranée (Cézilly *et al.* 1995, Rendón *et al.* 2001).

L'évolution récente des effectifs hivernants (2001 pour le PNBA, 2003 pour le Delta du fleuve Sénégal) montre que les Flamants roses sont aujourd'hui abondants en hiver en Mauritanie, avec des effectifs semblables à ceux observés à la fin des années 70. Suite à la mise en place du Parc National du Diawling et de la réserve du Chatt Boul, ces sites sont devenus des habitats importants pour les flamants hivernants.

L'hypothèse d'échanges entre les populations méditerranéennes et celle d'Afrique de l'Ouest est confirmée par nos observations puisque des flamants d'origine française et espagnole nourrissaient des poussins de la Grande Kiaone en 2004. Nos données confirment donc les observations passées anecdotiques. Plusieurs études récentes proposent de considérer que les colonies nicheuses de Flamants roses de l'ouest de la Méditerranée forment une métapopulation, c'est-à-dire une population constituée de plusieurs sous-populations (ici les colonies de reproduction) connectées (Nager *et al.* 1996, Balkız *et al.* sous presse). Les résultats de notre étude suggèrent que la colonie de la Grande Kiaone est comprise dans cette métapopulation. Cependant l'importance de ces échanges reste indéterminée comme l'existence possible d'échanges de la Mauritanie vers la Méditerranée. Il faut noter que les proportions de bagues observées provenant d'Espagne, de France ou d'Italie, ne nous permettent en aucun cas de déterminer l'abondance relative de flamants d'origine différente en Mauritanie. En effet, pour conclure sur cette question, il faudrait estimer le nombre de flamants de différentes cohortes bagués dans chacun de ces pays ayant survécu jusqu'alors et disponible pour l'observation.

Le succès de notre stratégie d'approche de la colonie de la Grande Kiaone devrait nous permettre de prolonger ce suivi à moyen terme afin de mieux quantifier l'importance des échanges entre les populations méditerranéennes et mauritanienne. Cela est indispensable pour développer un plan pour la conservation de cette espèce à une échelle géographique adéquate.

Remerciements

Nous tenons à remercier la Station Biologique de la Tour du Valat pour avoir financé cette étude et le Parc National du Banc d'Arguin pour avoir autorisé notre équipe à débarquer au pied des îles Kiaone et nous avoir assisté avec la logistique des expéditions. Nous sommes reconnaissants à Juan Aguilar Amat et Manuel Rendón Martos qui nous ont fourni les historiques des oiseaux bagués en Espagne dans le cadre de leur programme de recherche. Un grand merci également à Alan Johnson qui a corrigé ce texte et a rassemblé durant de longues années la littérature nécessaire à cette synthèse. Il nous faut aussi remercier Marc Pichaud pour avoir préparé la carte de la Mauritanie. Enfin, nous tenons à remercier O. Girard, B. Trollet et P.W.P. Browne pour leurs commentaires qui ont grandement amélioré la version finale de ce manuscrit.

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Short Notes — Notes Courtes

New bird records for Benin

During a visit from 24 Mar to 15 Apr 2006 to the Pendjari National Park (PNP) and its adjacent buffer zone, in Benin, we recorded four bird species new to the country, plus one with only a single previous record. All of these species occur in neighbouring countries, some with an apparently patchy distribution (Borrow & Demey 2004), so our observations are unlikely to indicate range extensions but suggest that the area is under-recorded. We also comment on the subspecies of one additional species.

***Pelecanus onocrotalus* Great White Pelican.** On 4 Apr a Great White Pelican flew over a small waterhole at c. 11°23'N, 1°36'E in the north of PNP. It was distinguished from the more greyish Pink-backed Pelican *P. rufescens* by its pure white plumage contrasting with the black remiges. On 7 Apr it was seen swimming on the water, when the yellowish pouch and pink bare skin around the eye confirmed the identification. It was seen again on 8 Apr. Great White Pelicans occur in Mali, Burkina Faso, Niger, and Nigeria (Dowsett & Forbes-Watson 1993, Borrow & Demey 2004), S Ghana (Grimes 1987) and S Togo (Cheke & Walsh 1996). Its distribution map in Brown *et al.* (1982) includes Benin, but there appear to be no previous published records.

***Hieraaetus ayresii* Ayres's Hawk Eagle.** On 29 Mar VS and C. Schmidl observed a small eagle flying over savanna at c. 10°52'N, 1°24'E in the buffer zone of the PNP. When first observed, the black and white mottled underwing coverts and the striped remiges and tail, together with its white head were obvious. The Honey Buzzard *Pernis apivorus*, which can have a similar colour pattern, was excluded by the short tail and especially the head. The Cassin's Hawk Eagle *Spizaetus africanus* was excluded by the underwing coverts, which were unlike the mainly black underwing coverts of adult Cassin's Hawk Eagle and the rufous-streaked underwing coverts of juveniles (Borrow & Demey 2004). Furthermore, the pure white of the head extended out along the leading edge of the wing (see Borrow & Demey 2004). Ayres's Hawk Eagle has a patchy distribution from Guinea to Congo. Our bird seems to be one of the northernmost records of it, with scattered observations in Gambia, Mali and Chad (Borrow & Demey 2004). It is included for Benin in the distribution map in Brown *et al.* (1982), but there is apparently no confirmed published record.

***Luscinia megarhynchos* Nightingale.** On 8 and 9 Apr a Nightingale was observed in a thicket besides the Pendjari river in the PNP at c. 11°28'N, 1°34'W. On 10 one was mist-netted nearby and its identity confirmed (outermost primary longer than primary coverts in contrast to Thrush Nightingale *L. luscinia*: Svensson 1992). The bird had a fat score of seven on the 0–8 scale of Kaiser (1993) indicating that it was preparing for migration. The Nightingale is confirmed for all countries around Benin (Dowsett

& Dowsett-Lemaire 1993, Borrow & Demey 2004). It is included for Benin in the distribution map in Keith *et al.* (1992), but there is apparently no published record.

***Myrmecocichla cinnamomeiventris* Cliff Chat.** We observed in the buffer zone near Batia at least five pairs of Cliff Chats, of which all the males had distinctive white head tops whereas those of the females were rufous grey indicating that they were *M. c. coronata*. The site was very close or identical to the site where Green (1980: Fig. 1, locality d) recorded *M. c. bambarae*. We cannot, however, confirm that two forms of Cliff Chat occur in the area, since we visited only one of Green's localities. The status of the two forms of this species in Benin remains unclear (cf. Keith *et al.* 1992).

***Cisticola eximius* Black-backed Cisticola.** Between 3 and 9 Apr at least two pairs and a single bird of the Black-backed Cisticola were observed on an open grassy plain at c. 11°23'N, 1°36'E. They were heavily streaked black on the top of the head and on the back, contrasting with the rufous neck and rump. Their behaviour and habitat use differed markedly from those of Croaking Cisticola *C. natalensis*, Short-winged Cisticola *C. brachypterus*, and Tawny-flanked Prinia *Prinia subflava*, which were also present. Unlike these species, the Black-backed Cisticolas avoided thick dry grass, seldom clung onto the grass, and were never seen in bushes. They were most often observed on the ground in more open and burnt areas with sparse short grass where they walked in an almost lark-like manner. On 9 Apr one was mist-netted and the identification confirmed (Fig. 1). The species is recorded from S Ghana (Grimes 1987) and N Togo (Cheke & Walsh 1996), and is not uncommon in Nigeria (Elgood *et al.* 1994). Our observations suggest that these populations are connected and that the species may occur regularly in N Benin in adequate habitats.



Figure 1. Black-backed Cisticola in the Pendjari NP, Benin, 9 Apr 2006.

***Cisticola guinea* Dorst's *Cisticola*.** On 14 Apr we observed a Dorst's *Cisticola* in the buffer zone next to the PNP c. 3 km south of Batia (10°54'N, 1°29'E). It was a medium-sized cisticola with the head top rufous and the back plain brown. Its underparts including undertail coverts appeared buffish-rufous. The bird did not call and was observed only for a short period when it came to drink water dripping out of rocks at the top of a gorge. It was distinguished from the Short-winged *Cisticola* by its larger size and from the Croaking *Cisticola* and Black-backed *Cisticola* by the unstreaked back. Singing *Cisticola* *C. cantans* is larger and in general darker than the bird observed, which was more rufous in general appearance especially on the underparts. Recently, Dowsett-Lemaire *et al.* (2005) suggested that *C. dorsti* is a synonym of the West African subspecies of Red-pate *Cisticola* *C. ruficeps guinea* and should accordingly be renamed *C. guinea*. According to Dowsett-Lemaire *et al.* (2005) there is only one *C. ruficeps* record from Benin, in the north, but no identification details were given (Holyoak & Seddon 1990).

We thank Aristide Tehou, Brice Sinsin and the Pendjari Park Project for the opportunity to stay and do research in the PNP and its buffer zone. C. Schmidl kindly provided Fig. 1. This study was part of the BIOLOG BIOTA-West framework funded by the German Federal Ministry for Education and Research.

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Received 2 July 2006; revised 1 November 2006.

Volker Salewski¹ & Judith Korb²

¹Prinz-Rupprecht-Str. 34, 93053 Regensburg, Germany. <salewski@orn.mpg.de>

²Biologie I, Universität Regensburg, 93040 Regensburg, Germany.

Bird diversity in Nyassang Forest Park, The Gambia (*Malimbus* 28: 134–142): corrections and further information

Following publication of my article on the birds of Nyassang (Ballantyne 2006), I have received a number of comments and questions on the records included. I therefore give the following additional information and (in some cases) corrections.

***Turtur tympanistria* Tambourine Dove.** This was a single record of a bird heard calling in atypical habitat for this species, and I now consider that it was probably a Black-billed Wood Dove *T. abyssinicus* or possibly a Blue-spotted Wood Dove *T. afer*. This record should therefore be omitted.

***T. afer* Blue-spotted Wood Dove.** The two records of this species were brief sightings and there remains a possibility of confusion with Black-billed Wood Dove, so these records require confirmation, although the species is known from Central River Division (T. Wachter pers. comm.).

***Ceyx picta* African Pygmy Kingfisher.** This species was noted in all habitats except the open water, while the similar Malachite Kingfisher *Corythornis cristata* was noted only twice, once in each rice field. The two were clearly distinguishable by crest and size of white cheek patch.

***Pyrrhurus scandens* Leaflove.** The single record of this species was based primarily on voice and, considering that there have been no records in the country since the early 1990s (C. Barlow pers. comm.), I now consider that it could have been a Blackcap Babbler *Turdoides reinwardtii*, which was common in the area, or perhaps a Stone Partridge *Ptilopachus petrosus*, which also has some similar calls (C. Barlow pers. comm.). This record should therefore be omitted.

***Ficedula hypoleuca* Pied Flycatcher.** Seen once in the disused rice field on 28 Aug 2005, which is a very early record of this species.

***Terpsiphone viridis* African Paradise Flycatcher.** “*Terpsiphone rufiventer* African Paradise Flycatcher” should have read “*Terpsiphone viridis* African Paradise Flycatcher”.

***Cinnyris chloropygia* Olive-bellied Sunbird.** This could have been a mis-identification of a male (lacking tail streamers) Beautiful Sunbird *C. pulchella*, which was common in the area, and should therefore be omitted.

***Vidua wilsoni* Wilson's Indigobird.** One male in full breeding plumage was observed closely and at length on the ground outside the hut where I lived. It resembled a Village Indigobird *V. chalybeata* except that its legs appeared light grey, and it was in the company of three Bar-breasted Firefinches *Lagonosticta rufopicta*, the specific host of Wilson's Indigobird (Barlow *et al.* 1999). It was unlike Baka Indigobird *V. larvaticola* and Quailfinch Indigobird *V. nigeriae* in lacking any greenish tinge to the plumage, and these parasitise Black-faced Firefinch *L. larvata* and Quailfinch *Ortygospiza atricollis* respectively (Borrow & Demey 2001), species that were not recorded in the area. However, no attention was given to the presence of a pale wing panel or purplish sheen to the plumage consistent with *V. wilsoni*, which remains unconfirmed in The Gambia. Cameroon Indigobird *V. camerunensis*, which parasitises various species and might occur in The Gambia (Borrow & Demey 2001), could not be eliminated, so this record remains tentative. Further field work in the area is recommended, to establish vocal mimicry of *L. rufopicta* by indigobirds at the site.

From the above corrections, three species are omitted from the list in Ballantyne (2006), making the total number of species observed in Nyassang 110 and therefore the predicted bird diversity figure for the park now stands at *c.* 285 species.

I thank Clive Barlow for drawing these records to my attention as unusual for the region, and him and Tim Wachter for help in compiling this note.

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Received 15 November 2006; revised 12 December 2006

Stephanie Ballantyne
41 Craiglomong Gardens, Balloch, West Dunbartonshire G83 8RP, Scotland
<stephistheone@hotmail.com>

Brazza's Martin *Phedina brazzae* in the Lesio-Louna Reserve, Congo Republic

Brazza's Martin *Phedina brazzae* is a rarely-recorded species, endemic to the Congo basin. It has been recorded on the banks of the Congo River, in the general region of

Brazzaville and Kinshasa, and adjacent savanna woodlands in the Congo Republic and Democratic Republic of Congo, south to Angola (Fry *et al.* 1992, Turner 2004). There is also one probable sighting in SE Gabon (Lekoni: F. Dowsett-Lemaire *in litt.*, Borrow & Demey 2001). In Congo Republic it is known only from four old records (Fig. 1; Dowsett & Dowsett-Lemaire 1989, Dowsett 1991): the type locality, Nganchu near Kwamouth on the Congo River (Oustalet 1886 *in* Chapin 1953, Malbrant & Maclatchy 1949), Jul 1884; not rare along the Congo River at Brazzaville, 1955–7 (Salvan 1972); one female collected and four pairs noted around a rocky escarpment on the side of a valley at Djambala, 1 Nov 1959 (Rand *et al.* 1959); one netted at a small pond at Gamakala, 30 km north of Brazzaville, 30 Sep 1962 (Salvan 1972). Here I report the first observation of *P. brazzae* in the Lesio-Louna Reserve, Congo (Fig 1; see also Dowsett-Lemaire 1997, King *et al.* 2004).

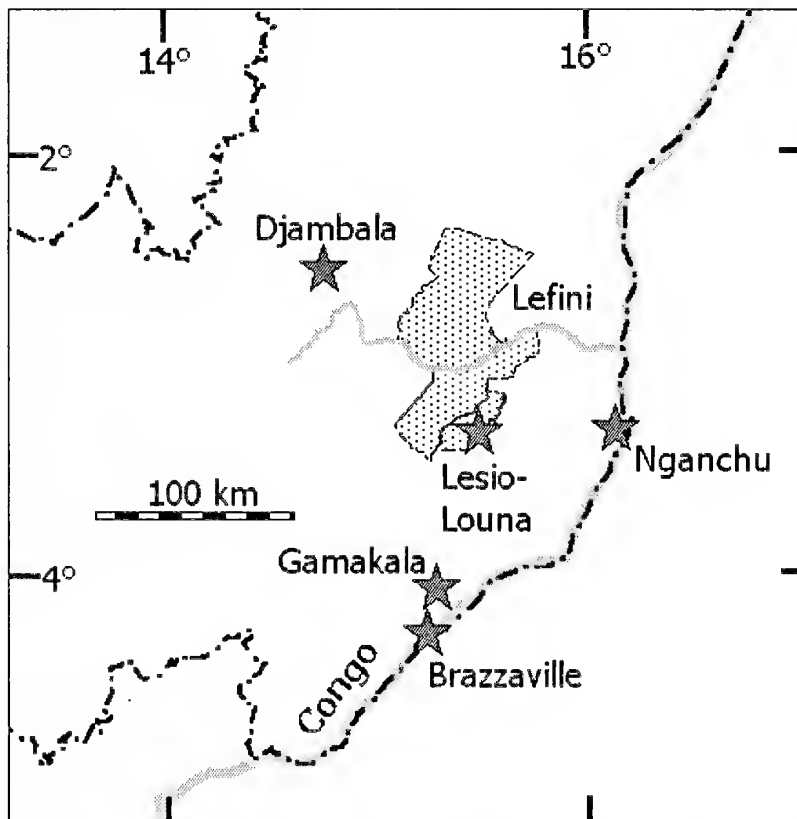


Figure 1. Locations of published observations of Brazza's Martin *Phedina brazzae* in Congo (stars), and other localities mentioned in the text.

I observed a single *P. brazzae* during the late afternoon on 20 Jun 2005, from a rocky outcrop near the village of Mâh, on a sandy, lightly wooded savanna ridge overlooking Lac Bleu (3°20'S, 15°28'E). The brown upperparts and streaky underparts characteristic of *P. brazzae* were clearly seen on several occasions, with good light from the evening sun and from a distance of 15–30 m. It appeared to be hawking for insects along the ridge, along with small numbers of Lesser Striped

Swallows *Hirundo abyssinica* and Rock Martins *H. fuligula*. A single Palm Swift *Cypsiurus parvus* was also recorded.

Little is known of the biology of *P. brazzae*. Chapin (1953) gave observations made by missionaries in DRC from 1922 to 1951, including that the species is usually seen near rivers, that it feeds like a small *Riparia*, that it nests during the dry season (c. Jun–Oct) in tunnels like those of *Riparia*, along sandy banks of rivers and a drainage ditch, that flocks have been observed in November, and when non-breeding it commonly forages with *H. abyssinica*. Salvan (1972) noted it flying often in a manner similar to *Riparia riparia*.

The Lesio-Louna observation was not made especially close to a river. Although Lac Bleu is 1.5 km from the site of the observation, and the small forested Lesio River 4.5 km, the species has not yet been reported from either of these relatively well-frequented sites. Neither have I observed it during 37 trips along the larger and sandier forested Louna River, in the final 25 km above its confluence with the Lefini River, or during 15 trips along the much larger Lefini River between its confluence with the Louna and the village of Mbouambé-Lefini, or during 21 generally shorter trips along the Lefini River upstream of its confluence with the Louna (all trips made between Jan 2003 and Feb 2006). This lack of records suggests that the observation reported here was of a non-breeding wanderer. This is supported by its association with other hirundines, in particular *H. abyssinica*, as Chapin (1953) noted for non-breeding birds in DRC. There are still no breeding records for Congo Republic. Dowsett-Lemaire (1997) recommended searching for the species in suitable habitats between the Congo River and Djambala. This would be particularly useful during the Jun–Sep dry season (King *et al.* 2004), to try to establish whether or not it breeds in Congo. Further observations along the Congo River, including at Brazzaville where the species was apparently “not rare” 1955–7 (Salvan 1972), would also help establish any seasonality in presence in Congo.

I thank the Ministère de l’Economie Forestière et de l’Environnement of the Congo Republic, and the John Aspinall Foundation (U.K.), for their long-term support of the joint management project for the Lesio-Louna Reserve. Françoise Dowsett-Lemaire provided constructive comments on the text, and Robert Prys-Jones and the staff of the British Museum (Natural History) at Tring were very helpful during the literature review.

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Received 27 June 2006

Revised 23 November 2006

Tony King
John Aspinall Foundation, BP 13977, Brazzaville, Republic of Congo
<ppgscience@yahoo.com>

News & Letters — Nouvelles & Lettres

Abbé René de Naurois, 1906–2006

René de Naurois, French priest and ornithologist, died on 12 January 2006. Born in Paris on 24 November 1906, he spent his childhood and youth as the eldest of five sons on his father's large estate, near Toulouse, where he very early developed a keen liking for wildlife. It took him many years, however, before he returned to the passion of his youth. Recently, in a book entitled *Aumônier de la France Libre* (2004, Perrin, Paris), he told his story, of a tremendously active life on many fronts, especially as chaplain in the Free French Forces during World War II, before he eventually became a fully fledged ornithologist. As Jacques de Naurois, one of his many nephews, observed, in birds he must have found an uncommon sense of peace after the horrors of the war, a feeling he shared with many ornithologist colleagues. In the first chapter of this book, he tells how, when he was barely ten or eleven, he would draw eggs and nests of all the familiar birds on the estate with such accurate detail that he still marvelled at them as an old man when they were rediscovered in the family house. Every year, too, his mother would make it a special festival for the five boys to celebrate the day the Hoopoe was first seen in the spring over the fields. He also tells the very moving moment when, some 50 years later, in the depth of a forest in São Tomé, he heard the song of an African species of oriole that recalled to him the familiar song in his father's garden.

His parents having insisted that before becoming a priest (in 1936) he go to university, he took degrees in mathematics and physics, then theology and finally German philosophy, which he went to study in pre-war Berlin. There, from 1933 till 1939, he was in contact with German opponents to rising Nazism and was able to send regular reports to his Archbishop, Mgr Saliège in Toulouse, on the awful dangers looming ahead for Europe. He was therefore very well prepared to take an active part in the local resistance in Toulouse after 1940, helping fugitives or Jews to escape during the occupation of France, then joining De Gaulle in England after escaping himself from Toulouse through Spain as the Gestapo was about to arrest him in 1942. There, he joined the Kieffer Commando as chaplain and landed with his close friend, Lord Lovat, on D-Day, on a beach in Normandy. He was made *Compagnon de la Libération*, a special order created by De Gaulle for his war companions, but was also most proud when he received the Military Cross from the hands of Colonel Dawson, with whom he had also landed and who became his closest friend in England afterwards until his death in 1987.

It is only in 1954 that he came out as an ornithologist with a future, after publication of two articles in *Oiseau Rev. fr. Orn.* 24, on raptors in the Toulouse region and vultures and Lammergeier in Morocco. In 1959, he followed Noël Mayaud's and Henri Heim de Balsac's encouragements to explore the West African coastal avifauna, and was the first to describe and detail the wealth of nesting species of Banc d'Arguin, a major investigation in what has become a paradise for

ornithologists. South of Nouadhibou (formerly Port-Etienne) in Mauritania, were multitudes of pelicans, cormorants, herons, spoonbills, flamingos and gulls, as he made clear in a long article (1959, *Alauda* 27: 241–308). In 1976, this part of the coast became the Banc d'Arguin National Park, now under special protection of the trustees of the Banc d'Arguin International Foundation, an initiative led by Luc Hoffmann. Between 1960 and 1971, de Naurois, by then Researcher at the French CNRS, led explorations of this coast between former Spanish Sahara and the Republic of Guinea, the results of which eventually went into a Doctorate Thesis. This voluminous work, *Peuplements et cycles de reproduction des oiseaux de la côte occidentale d'Afrique* (1969, *Mém. Mus. Nat. Hist. Nat.* 56; 312 pp.), would have deserved translation for all the wealth of first hand observations and descriptions it contained. But most of all, it offers a remarkable reflection, from a biogeographical viewpoint, on the privileged position of a maritime coast at a position that both unites and divides the Palaearctic and Afrotropical zones. Although 66 years old by then, René de Naurois went on undeterred, investigating difficult territories and forlorn islands, with ever renewed relish in the same risky landings on uninviting islets every time he sensed he could hit upon a new species. Over 30 articles published between 1964 and 1992 testify to his having explored the Cape Verde Islands through and through. In 1995, Cornelis J. Hazevoet, the Dutch ornithologist, published his *Birds of the Cape Verde Islands* (British Ornithologists' Union, Tring) with these words: "Dedicated to René de Naurois who has done more for Cape Verde ornithology than anyone else". Between 1978 and 1985, the indefatigable Abbé published seven articles on the birds of New Caledonia and left a nearly finished book on this island in the Pacific Ocean. Again, from 1973 to 1988, he also issued 18 publications on the birds of São Tomé and Príncipe islands, and a bilingual guide, in French and Portuguese, *Les Oiseaux des Îles du Golfe de Guinée (São Tomé, Príncipe et Annobon)* (1994, Instituto de Investigação Científica Tropical, Lisbon). This same year, another guide came out with the same publisher, *Les Oiseaux des Îles du Cap-Vert*. He had an invaluable collection of bird eggs, collected across the world and the years before 1975, after which date he refrained from collecting and finally handed over the collection in 1992 to the Museum of Natural History in Geneva.

His last scientific expedition took place in 1987, in New Caledonia, where he climbed his last tree. After this he still went to Israel in 1989 and to New York in 1994 after being declared "Righteous among the Nations" for the help given to persecuted Jews during the war, and to Oxford (The Edward Grey Institute) or Tring for more occasional ornithological work, always very thankful for the warm welcome and the efficient help and care he would meet there at all times. On 12 January 2006, he was back from a very tiring trip, in biting cold, to Toulouse to see his dying brother. He had met there many friends and younger colleagues, and planned ahead for further publications, and filled his agenda with forthcoming meetings and collaborations of all kinds. He died so to speak by surprise, of a heart attack, in the late morning, conscious to the very last, as he had lived.

Gisèle Venet

Birds of Mauritania: request for information

An annotated checklist of the birds of Mauritania is in preparation. Ornithologists are kindly requested to send their records to the main author: Paul Isenmann, CEFE/CNRS, 1919 route de Mende, F-34293 Montpellier cedex 5, France; <paul.isenmann@cefe.cnrs.fr>.

Les oiseaux de Mauritanie: demande d'informations.

Une liste commentée des oiseaux de Mauritanie est en préparation. Ceux qui souhaiteraient enrichir cette liste par leurs observations sont invités à les envoyer à l'auteur principal: Paul Isenmann, CEFE/CNRS, 1919 route de Mende, F-34293 Montpellier cedex 5, France; <paul.isenmann@cefe.cnrs.fr>.

Reviews — Revues

Les Oiseaux du Banc d'Arguin, par Paul Isenmann (sans date). 190 pp. Fondation Internationale du Banc d'Arguin, Arles. ISBN 2-9514914-6-8, broché €9 (plus frais de port). Chez FIBA, La Tour du Valat, Le Sambuc, 13200 Arles, France. The book is also available in English.

Cet ensemble d'îles situé "à la charnière des zones paléarctique et afrotropicale" a été redécouvert par René de Naurois en 1959 (cf. notice nécrologique dans cette même livraison) et bénéficia de l'actif patronage de Luc Hoffmann (ainsi que l'écrit l'auteur "en hommage à R. de N. le découvreur et à L. H. le protecteur"). À vrai dire, ces îles qui font le passage du paléarctique au tropical à l'extrémité occidentale du continent africain n'étaient pas totalement inconnues mais surtout complètement ignorées. Et c'est grâce à la sagacité d'Heim de Balsac et de Noël Mayaud que l'activité de R. de Naurois fut orientée vers leur étude. Disons que ce "paradis de l'ornithologie" devait se mériter car ces îlots exposés au soleil, balayés par le vent, dépourvus d'eau douce et d'accès difficile ressemblaient plutôt à un purgatoire (R. de Naurois com. pers.).

Le Banc d'Arguin est situé entre 27°30' et 15°0'N, et 16°45' et 16°0'W; il est "avant tout saharien avec une frange méridionale sahélienne" et doit son exceptionnelle richesse avienne à des remontées d'eau froide, très riches en phosphates. C'est, selon l'auteur, un "système laguno-marin en pleine mer, reflet d'un passé sans doute deltaïque".

L'ouvrage comprend sept chapitres. Le premier chapitre retrace l'histoire du Banc d'Arguin dans les 50 dernières années, son exploration ornithologique depuis sa découverte jusqu'à maintenant et les différentes missions qui s'y sont succédées. Le deuxième décrit l'environnement de ces îles, à savoir rappel de sa géographie, de son climat, de la complexité des courants marins et de sa végétation. Le chapitre 3 présente une liste commentée des 299 espèces d'oiseaux observées au moins une fois, leur statut (nicheur ou de passage), leur abondance, leur écologie ainsi que leur origine. Les chapitres 4 et 5 racontent des colonies d'oiseaux nicheurs (au moins 36 dont deux endémiques *Ardea monicae* et *Platalea leucorodia balsaci*), regroupant entre 25 000 et 50 000 couples, leurs effectifs respectifs, leur répartition sur les principaux biotopes, leur cycle de reproduction, et de ses 2 000 000 limicoles, sans doute la zone la plus riche en limicoles de l'Ancien Monde (F. Roux, p. 13). Ce chapitre comporte des commentaires sur les conditions exceptionnellement favorables à cet hivernage. Le chapitre 6 analyse l'avenir du Banc d'Arguin et sa protection reviennent à la République Islamique de Mauritanie. C'est en effet un site unique en Afrique, à la fois comme haut lieu de la biodiversité mondiale et lieu de vie d'une grande richesse pour les populations locales. La Mauritanie saura-t-elle préserver ce trésor face aux menaces que représente l'extraction du pétrole à faible distance?

L'ouverture du parc aux touristes, grâce à la route Nouakchott-Nouadibou, sera peut-être la fin du splendide isolement des îles, connues et utilisées des seuls pêcheurs Imraguen et des oiseaux. Une bibliographie de 11 pages arrêtée en juin 2006 paraît aussi complète que possible. Un index des noms scientifiques des oiseaux, complété d'un index en français ou en anglais selon les éditions termine cet ouvrage. Il y a une carte du parc et de sa situation en Afrique. L'abondante et bonne illustration comprend des photographies de biotopes et d'espèces ainsi que des planches de S. Nicolle. Elles ne figurent pas en face de l'espèce décrite mais sont réparties dans l'ouvrage. Elles ne comportent pas non plus de renvoi au texte.

En conclusion, ce livre, écrit à l'occasion du trentième anniversaire du PN du Banc d'Arguin et du vingtième anniversaire de la Fondation Internationale du Banc d'Arguin, ne peut qu'être recommandé à tous ceux qui veulent découvrir ce haut lieu de l'ornithologie et aider à sa sauvegarde.

G.J. Morel

Society Notices — Informations de la Société

Meeting of W.A.O.S. Council, October 2006, and changes in Council

On Saturday 7 October 2006, a meeting of W.A.O.S. Council was held in Bréville-les-Monts, France. Council members present were: G.J. Morel (President), N. Robin and A. Tye. The following additional Council members were consulted by telephone: H.S.S. Thompson (during the meeting), R.E. Sharland and R. Wilkinson (after the meeting). Preliminary results were then circulated to all Council members for further discussion.

Council membership

The main business of the meeting was to discuss possible replacements for several Council members, who had indicated their desire to step down or reduce their activities. The President wished to retire from that post, the Vice-President had wanted to step down for some time and had submitted his formal resignation, the Treasurer had indicated that he would also like to pass on that task and the Secretary felt unable to dedicate sufficient time to the work required. Council members therefore approached a number of possible replacements during 2006.

President. A number of names were discussed during the meeting and subsequently. The decision was unanimous in favour of Dr Jean-Marc Thiollay, who was approached and accepted the position. Dr Thiollay is a respected professional ornithologist with strong West African experience. See his biography below.

Vice-President. Several names were discussed for this role, including the possibility of abolishing the post. It was decided to maintain the position, and to ask Dr Roger Wilkinson to accept it. Dr Wilkinson took no part in these discussions, and later accepted the change in role from Secretary to Vice-President.

Secretary. Once again, several names were discussed in relation to this position, but the question of a new Secretary remains to be resolved. Until it is, Dr Wilkinson will continue to carry out the duties of Secretary.

Treasurer. Fewer names were discussed in relation to this post, since accountancy experience is considered necessary for it. It was also felt that the post should continue to be based in the U.K., given that the largest number of subscriptions is paid in £ Sterling, and most of the Society's costs (including printing costs) are incurred there. Bob Sharland has indicated that he is willing to continue in the post until a suitable alternative can be found. Dr Marie-Yvonne Morel has indicated that she is willing to continue to collect € subscriptions.

Regional Contact. The question was again raised of appointing to Council a regional contact with the aim of promoting the Society to resident ornithologists in W African (especially francophone) countries. However, no person could be identified who

could take this role actively to all W African countries, and it was therefore decided not to create a new Council position for this role, but to seek individuals who might act as country representatives.

Other matters discussed

Accounts. The Treasurer sent the accounts for 2006 up to August. N. Robin noted variations in income from 2004 to 2005. The Treasurer later confirmed that this was due to late subscriptions. It was agreed that future reports of accounts would include a brief explanation of such points in notes accompanying the balance sheet.

Web site. N. Robin raised the question of using the web site to raise funds, and questioned whether the completeness of the *Malimbus* files freely available on the site might result in declining income from sales of back numbers and loss of members. This was discussed subsequent to the meeting with the Webmaster, and it was decided to make no changes to present policy for the time being, but to promote membership of the Society more visibly on the site and by other means.

Malimbus colour and printing. The feeling was general that the colour plates appearing in *Malimbus* 28(2) were a success and that colour printing was worth continuing, with the condition that colour photographs should make a useful contribution to an article.

Membership subscription. G.J. Morel considered the cost low, especially considering the improvements made in journal quality over recent years. The subscription has been unchanged for more than 15 years. Given that income is so far still on average balancing expenditure, and that annual expenditure on colour was not yet well determined, it was agreed to wait a year or so to see what effect the inclusion of colour photographs would have on the accounts, before considering a subscription increase.

Research Grants. It was agreed that better follow-up of grants is needed, to ensure that reports are received from grantees. These should include a financial report.

Conclusion of the meeting

It was agreed to send a report and questionnaire on replacement of retiring Council members to all Council members after the meeting, in order to finalise the selection of new Council members and clear up outstanding other points.

W.A.O.S. Council

Réunion du Conseil de S.O.O.A. Octobre 2006, et changements au Conseil

Le samedi 7 octobre 2006, une réunion du Conseil de S.O.O.A. s'est tenue à Bréville-les-Monts, France. Les membres du Conseil présents étaient: G.J. Morel (Président), N. Robin et A. Tye. En outre, furent consultés par téléphone H.S.S. Thompson (durant la réunion), R.E. Sharland et R. Wilkinson (après la réunion). Les premiers résultats furent alors distribués à tous les membres du Conseil pour discussions ultérieures.

Composition du Conseil

La principale tâche de la réunion était de discuter du remplacement de plusieurs membres du Conseil qui avaient exprimé leur désir de se retirer ou de réduire leur activité. Le Président désirait démissionner, le Vice-Président avait voulu se retirer quelque temps puis envoya sa démission officielle, le Trésorier avait indiqué qu'il désirait aussi transmettre sa charge et le Secrétaire se sentait incapable de consacrer assez de temps à son poste. Les membres du Conseil avaient par conséquent pressenti un certain nombre de candidats possibles au cours de 2006.

Président. Quelques noms furent proposés au cours de la réunion et après celle-ci. La décision fut unanime en faveur du Dr Jean-Marc Thiollay qui avait été consulté et accepta le poste. Dr Thiollay est un ornithologue professionnel réputé avec une profonde expérience de l'Ouest africain. Voir sa biographie ci-dessous.

Vice-Président. Plusieurs noms furent proposés pour ce poste, y compris même sa suppression. On décida de garder cette fonction et de demander au Dr Roger Wilkinson s'il l'acceptait. Dr Wilkinson ne participait pas aux discussions et accepta par la suite de passer de Secrétaire à Vice-Président.

Secrétaire. De nouveau, plusieurs noms furent examinés pour cette fonction, mais la question d'un nouveau Secrétaire reste en suspens. Pour le moment, Dr Wilkinson continuera à assurer la tâche de Secrétaire.

Trésorier. Il n'y eut que peu de noms proposés pour ce poste, car une expérience de la comptabilité est jugée nécessaire. On a aussi considéré que le titulaire de cette fonction devait demeurer au R.U. étant donné que la majorité des cotisations est payée en livres £ et que l'essentiel des dépenses de la Société (y compris l'impression) y est réglé. Bob Sharland a fait savoir qu'il veut bien continuer jusqu'à ce qu'une solution convenable soit trouvée. Dr Marie-Yvonne Morel a indiqué qu'elle veut bien continuer à réunir les cotisations en €.

Contacts Régionaux. La question a de nouveau été soulevée de nommer au Conseil un représentant régional dans le but de faire connaître la Société aux ornithologues résidant dans l'Ouest africain (particulièrement francophone). Cependant, personne ne put être trouvé pour tenir ce rôle de façon active dans tous les pays de l'Ouest africain; il fut donc décidé de ne pas créer de nouveau poste mais de chercher des personnes qui joueraient le rôle de représentants régionaux.

Autres sujets discutés

Rapport financier. Le Trésorier envoya le relevé des comptes pour 2006 jusqu'en août. N. Robin nota des variations dans les recettes de 2004 à 2005. Le Trésorier confirma ultérieurement que cela était dû au retard dans le paiement des cotisations. Il fut convenu que les prochains rapports devraient inclure une brève explication de tels points en annexe du bilan.

Site web. N. Robin souleva la question d'utiliser le site pour recueillir les fonds et se demanda si la totalité des dossiers de *Malimbus* en accès gratuit n'entraînait pas une diminution des recettes provenant de la vente des anciens numéros et la perte

d'adhérents. Cela était discuté au cours d'une séance ultérieure avec le Webmestre et il fut décidé de ne rien changer pour l'instant à la politique actuelle, mais de promouvoir l'adhésion à la Société de façon plus évidente sur le site et par d'autres moyens.

Impression de planches en couleur. Le sentiment fut général que les planches en couleur dans le numéro de *Malimbus* 28(2) furent un succès et que l'impression en couleur méritait d'être continuée à la condition que les photographies en couleur soient une contribution utile à l'article.

Cotisation des membres. G.J. Morel fit remarquer le prix faible de la cotisation, considérant en particulier les améliorations de la qualité du journal ces dernières années. La cotisation reste inchangée depuis plus de 15 ans. Étant donné que les recettes sont encore à l'heure actuelle à peu près en équilibre avec les dépenses et que les dépenses annuelles de l'impression en couleur ne sont pas encore bien chiffrées, il fut décidé d'attendre un an ou plus pour voir quel impact l'inclusion des photographies en couleur aura sur les comptes avant de songer à une augmentation des cotisations.

Bourses de recherches. Il fut convenu qu'un meilleur suivi des bourses était nécessaire pour s'assurer que les bénéficiaires envoient bien un compte rendu de leurs travaux. Celui-ci devrait comporter un rapport financier.

Conclusion de la réunion.

Il fut convenu d'envoyer un rapport et un questionnaire pour le remplacement des membres démissionnaires du Conseil à tous les Membres du Conseil après la réunion afin de finaliser la sélection des nouveaux membres du Conseil et de tirer au clair les autres points en suspens.

Le Conseil de S.O.O.A.

The new W.A.O.S. President, Dr Jean-Marc Thiollay

Now just retired, Jean-Marc Thiollay has worked all his professional life as a researcher, and then a research director, of the French National Centre of Scientific Research (CNRS), at the University of Paris, first in the Ecole Normale Supérieure, then in the Museum National d'Histoire Naturelle. After graduating from university, and many raptor studies in France and Europe, he spent six years in West Africa, 1967–73, studying the ecology of the avian community of a forest-savanna contact zone in Ivory Coast and the seasonal migrations of African raptors within West Africa (the topic of his Ph.D.). Thereafter, between visits to monitor the long-term dynamics of the bird population of the main study site in Ivory Coast, he worked in many tropical countries (especially Gabon, Uganda, India, Indonesia, Vietnam, Mexico and Colombia) with a special emphasis on French Guiana. His main interests were tropical raptors, and more generally rainforest bird ecology and conservation, the

influences of habitat degradation, fragmentation, hunting and protected areas. During recent years, he has also repeated some of his former extensive raptor counts throughout West Africa to document the decline of some species (mainly eagles and vultures) over the last 30 years. Since 1962, he has published almost 200 papers in books or scientific journals. He has always been deeply involved in bird and nature conservation organizations both in France and internationally, and a regular attendant of ornithological and conservation congresses and meetings. As a result, he is a board member of several regional, national and international scientific or conservation bodies, but still manages to do much field ornithology at home (in eastern France) and during frequent travels with his wife Françoise to extend one of the highest life lists of the birds of the world.

Le nouveau Président de la S.O.O.A., Dr Jean-Marc Thiollay

Aujourd'hui à la retraite, Jean-Marc Thiollay a consacré sa vie professionnelle à la recherche, d'abord comme chercheur puis directeur de recherche au Centre National de la Recherche Scientifique (CNRS) à l'Université de Paris (Ecole Normale Supérieure puis Muséum National d'Histoire Naturelle). Après ses études universitaires en France et en Europe, il a passé six ans en Afrique de l'Ouest de 1967 à 1973, pour approfondir le fonctionnement d'un peuplement d'oiseaux dans une zone de contact savane-forêt en Côte d'Ivoire, et les migrations saisonnières des rapaces africains en Afrique de l'Ouest (objet d'une thèse de doctorat). Puis, en dehors de quelques séjours pour suivre la dynamique à long terme du peuplement du site d'étude de Côte d'Ivoire, il a travaillé dans de nombreux pays tropicaux, notamment Gabon, Ouganda, Inde, Indonésie, Vietnam, Mexique, Colombie, etc, et particulièrement en Guyane Française. Ses centres d'intérêt ont surtout été les rapaces tropicaux et plus généralement l'écologie et la conservation des oiseaux de forêts denses, l'influence de leur dégradation et de leur fragmentation, de la chasse et des zones protégées. Dans les années récentes, il a aussi refait nombre de ses recensements anciens de rapaces en Afrique de l'Ouest afin de chiffrer 30 ans plus tard le déclin de certaines espèces (surtout aigles et vautours). De 1962 à 2007, il a publié près de 200 articles dans de nombreux livres scientifiques d'ornithologie et d'écologie. Il a en outre toujours été très impliqué dans les organismes de protection des oiseaux et de la nature aux niveaux français et international et participe régulièrement à de nombreux congrès ou réunions dans ces domaines. Il est membre administrateur de nombreuses sociétés françaises et internationales et poursuit néanmoins activement l'ornithologie de terrain autour de chez lui (en Champagne) et au cours de fréquents voyages, avec sa femme Françoise, pour compléter l'une des plus importantes "life list" des oiseaux du Monde.

**West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain**

Provisional* Revenue Account for the year ended 31 December 2006

Income		<u>2005</u>
Subscriptions, donations and back numbers	£1659	£3034
Interest	<u>78</u>	<u>96</u>
	<u>£1737</u>	<u>£3130</u>
Expenditure		
Malimbus production and distribution	£2615	£3268
WAOS Research Grants	0	638
Scanning Malimbus for web site	<u>381</u>	<u>0</u>
	2996	3906
Deficit for year	<u>1259</u>	<u>776</u>
	<u>£1737</u>	<u>£3130</u>

Balance Sheet as at 31 December 2006

Assets		
Bank balances	£5172	6431
Less subscriptions paid in advance	<u>225</u>	<u>225</u>
	<u>4947</u>	<u>6206</u>
Accumulated funds		
Balance at 1 January	£6206	£6982
Less deficit for year	<u>1259</u>	<u>776</u>
	<u>£4947</u>	<u>£6206</u>

*Awaiting Euro bank statement.

R.E. Sharland, Treasurer

Instructions to Authors

Malimbus publishes research papers, reviews and news about West African ornithology.

Papers and Short Notes must be original contributions; material published elsewhere, in whole or in part, will not normally be accepted. Short Notes are articles not exceeding 1500 words (including references) or three printed pages in length. Wherever possible, manuscripts should first have been critically scrutinised by at least one other ornithologist or biologist before submission. Manuscripts will be sent for critical review to at least one relevant authority.

Items for **News & Letters** should not exceed 1000 words.

Contributions are accepted in English or French; editorial assistance will be made available to authors whose first language is not one of these. Submission by email (attached file) is preferred. For submissions on paper, two copies are required, typed on one side of the paper, with double spacing and wide margins. Consult the editor for further details, e.g. acceptable software.

All Papers (but not Short Notes) should include a **Summary**, not exceeding 5% of the paper's length. The Summary should include brief reference to major findings of the paper and not simply review what was done. Summaries will be published in both English and French and will be translated as appropriate by the Editorial Board.

Format of tabular material, numbers, metric units, references, etc. should match recent issues. Note particularly: dates are written 2 Feb 1990 but months standing alone may be written in full; times of day are written 6h45, 17h32 and coordinates in the form 7°46'N, 16°4'E (no leading zeros); numbers up to ten are written in full, except when followed by abbreviated units (e.g. 6 m), numbers from 11 upwards are written in figures except at the beginning of a sentence. All references mentioned in the article, and only such, must be listed in the bibliography.

Avifaunal articles must contain a map or gazetteer, including all localities mentioned. They should include brief notes on climate, topography, vegetation, and conditions or unusual events prior to or during the study (e.g. late rains etc.). **Species lists** should include only significant information; full lists are justified only for areas previously unstudied or unvisited for many years. Otherwise, include only species for which the study provides new information on range, period of residence, breeding etc. For each species, indicate range extensions, an assessment of abundance (*Malimbus* 17: 36) and dated breeding records; indicate migratory status and period of residence only as shown by the study. Where appropriate, set data in context by brief comparison with an authoritative regional checklist. Lengthy species lists may be in tabular form (e.g. *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) or in the textual format of recent issues. **Taxonomic sequence and scientific names** (and preferably also **vernacular names**) should follow Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), or Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) or *The Birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), unless reasons for departure from these authorities are stated. A **more complete guide for authors** of avifaunal papers, including the preferred abundance scale, appeared in *Malimbus* 17: 35–39; a copy may be obtained from the Editor, who will be happy to advise on the presentation of specific studies.

Figures should be prepared as for final reproduction, allowing for 20–50% reduction. When designing Figures, pay attention to *Malimbus* page-shape. Figures prepared in or scanned into an appropriate graphics package and saved at high resolution are preferred. They should be supplied as graphics files, and not pasted into a text file. Low-resolution files and poor-quality printouts will not be accepted. Authors are encouraged to submit **photographs** that illustrate salient points of their articles. Photographs should be high-contrast (for publication in monochrome) and high resolution (at least 600 dpi). They should be supplied in graphics file format (e.g. jpg or tif) and not pasted into a Word file. Consult the Editor for further advice.

A pdf file of Papers and Short Notes, and one copy of the issue in which they appear, will be sent to single or senior authors, *gratis*.

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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain



VOLUME 29 Number 2

September 2007

ISSN 0331-3689

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

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La correspondance doit être adressée comme suit:

- au Rédacteur en Chef (Dr A. Tye, SPREP, P.O. Box 240, Apia, Samoa; <alantye@gmail.com>) pour les articles à soumettre à *Malimbus*,
- au Trésorier (1 Fisher's Heron, East Mills, Fordingbridge, Hampshire, SP6 2JR, U.K.) pour les abonnements, les questions financières et les numéros anciens;
- au Secrétaire du Conseil (Wildekamp 32, 6721 JD Bennekom, The Netherlands; <brouwereac@wanadoo.nl>) pour les demandes des Bourses de Recherches;
- au Secrétaire adjoint (BirdLife International, ICIPE Campus, Kasarani Road, P.O. Box 3502-00100, Nairobi, Kenya; <hazell.thompson@birdlife.or.ke>) pour la présence aux réunions ou des suggestions pour celles-ci.
- au Webmestre <pbrowne@cyberus.ca> pour les questions du site web.
- au Président (2 rue Rivière, F-10220 Rouilly Sacey, France; <jm.thiollay@wanadoo.fr>) pour les questions d'intérêt général.

La Société tire son origine de la "Nigerian Ornithologists' Society", fondée en 1964. Son but est de promouvoir l'ornithologie ouest-africaine, principalement au moyen de sa revue *Malimbus* (anciennement *Bulletin of the Nigerian Ornithologists' Society*).

Les demandes d'adhésion sont les bienvenues. Les cotisations annuelles sont de £15 (€22) pour les Membres Ordinaires et de £30 (€45) pour les Sociétés (les cotisations peuvent être payées en £ sterling au Trésorier ou en Euro au Président). Les Membres Ordinaires reçoivent *Malimbus* par courrier ordinaire et les Sociétés par courrier aérien, gratuitement. Un supplément est exigé des Membres Ordinaires pour le courrier aérien (demander au Trésorier le tarif).

Anciens Numéros: Les Volumes 11–14 (1975–78) du *Bulletin of the Nigerian Ornithologists' Society* (du même format que *Malimbus*) sont disponibles à £2/€3.50 par numéro (£4/€7 par volume) ou £15/€25 l'ensemble. Les Volumes 1–9 de *Malimbus* sont disponibles à £3/€5 par numéro (£6/€10 par volume) et les Vols 10–29, à £5/€8.50 par numéro (£10/€17 par volume). Une série complète de *Malimbus* (du Volume 1 jusqu'au plus récent) peut être acquise avec un rabais de 20% sur le prix total. Frais de port et emballage sont gratuits. Veuillez joindre le paiement à votre commande et l'adresser au Trésorier.

Bourses de Recherches de la S.O.O.A.: Les conditions à remplir pour les candidatures se trouvent dans *Malimbus* 25: 72–75 et sur le site web, ou peuvent être obtenues auprès du Secrétaire du Conseil (adresse ci-dessus).

The avifauna of the proposed Kyabobo National Park in eastern Ghana

by Françoise Dowsett-Lemaire & Robert J. Dowsett

Le Pouget, 30440 Sumène, France. <dowsett@aol.com>

Received 28 June 2006; revised 14 May 2007.

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Summary

The proposed Kyabobo National Park (218 km²) in E Ghana is immediately adjacent to the larger Fazao-Malfakassa NP in Togo. It is set in a range of steep hills in the forest-savanna transition zone, and forest (mainly semi-evergreen) is currently expanding over savanna. The first ornithological survey of the area, based on two visits, in the rains (10 Jul to 2 Aug 2004) and the late dry season (18–23 Feb 2005), identified 235 bird species. There is a large forest component with a rather impoverished savanna element. The most important biome is Guineo-Congolian, with at least 65 bird species. Practically all observations of forest birds represent extensions of known range, to the north. The Barred Owlet *Glaucidium capense* (discovered in Ghana in 2004) is widespread at forest edges. Baumann's Bulbul *Phyllastrephus baumanni* is common in rank understorey of forest clearings (its natural habitat) and secondary growth in farmbush, even where invaded by the exotic shrub *Chromolaena odorata*. Observations of Lagden's Bush Shrike *Malaconotus lagdeni* in the forested hills in the south of Kyabobo are the first in Ghana since the 19th century type collection. The Long-billed Pipit *Anthus similis* was found breeding on the thinly vegetated ridge of one of the peaks.

Résumé

L'avifaune du futur Parc National de Kyabobo dans l'est du Ghana. Le futur Parc National de Kyabobo (218 km²), dans l'est du Ghana, fait bloc avec le PN de Fazao-Malfakassa au Togo voisin. Il englobe une chaîne de hautes collines escarpées et se situe dans la zone de transition forêt/savane. La forêt (de type semi-sempervirent) est actuellement en expansion sur la savane. Les premières enquêtes ornithologiques, menées en saison des pluies (10 juillet au 2 août 2004) et en fin de saison sèche (18–23 février 2005) ont permis d'identifier 235 espèces, avec une composante forestière beaucoup plus importante que l'élément savanicole. Le biome guinéo-congolais comprend au moins 65 espèces. Presque toutes les observations d'espèces

forestières représentent des extensions de l'aire connue de distribution vers le nord. La Chevêchette du Cap *Glaucidium capense* (découverte au Ghana en 2004) est répandue sur les lisières forestières. Le Bulbul de Baumann *Phyllastrephus baumanni* est commun dans son milieu naturel (végétation dense et basse des clairières forestières) mais aussi dans les friches post-culturelles, même celles envahies par le buisson rudéralisé *Chromolaena odorata*. Les observations du Gladiateur de Lagden *Malaconotus lagdeni* dans les forêts du sud de Kyabobo sont les premières au Ghana depuis la récolte du type au 19ème siècle. Nous avons trouvé le Pipit à long bec *Anthus similis* nichant sur la crête rase d'un des sommets de Kyabobo.

Introduction

The proposed Kyabobo National Park (218 km²) in E Ghana is adjacent to the larger Fazao-Malfakassa National Park in Togo. It is bordered to the east by the Koue river, which flows northwards, following the international boundary. The park was named after Mount Kyabobo (also spelt Djebobo), which at 887 m is the second tallest hill in Ghana, but this peak as well as the surroundings of Shiare are now excluded from the proposed park, whose boundaries were redrawn in 2004 (Fig. 1). A small amount of farming has taken place in the reserve, most farmers coming from Shiare where the rugged topography makes cultivation difficult.

The park is situated in the northern sector of the forest-savanna transition zone. A few km north of Koue the landscape changes dramatically into dry savanna woodland, whereas to the south (as around Shiare) the hills appear more extensively forested. The topography is extremely broken, with a succession of steep hills throughout, several just exceeding 800 m. Apart from a few ridge tops which may be almost bare of trees, the park is generally densely wooded or forested. Woodland and dry forest (mainly semi-evergreen) intermingle extensively. A striking feature of the area is the current rapid expansion of forest over woodland, presumably the result of increasing rainfall.

The avifauna of the proposed park had never been studied. Moyer (1996) mentions a few species he encountered in an area of forested hills just to the south (2.5–4 km south of Shiare), in Oct 1994. We carried out two surveys in the park totalling 4 weeks: in the middle of the rains (10 Jul to 2 Aug 2004, henceforth termed the "July" study), and in the late dry season (18–23 Feb 2005). In July, our time was spent mainly in the lower Laboum basin in the south, and in the Koue-Nazeni area in the north, with a few days around Breast Mountain in the southwest. Our February visit was centred in the upper Laboum basin, rendered more accessible in dry weather, including one day's climb to one of the highest peaks ("South Repeater": Fig. 1). One day (and night) was also spent in riverine forest at Pawa camp, an exceptionally luxuriant strip of forest benefiting from much shade provided by the

surrounding hills. July–August were extremely wet, with heavy showers on most days; our February visit coincided with the first (early) storms of the year, but showers do not normally become regular before about April (P. Hartley pers. comm.).

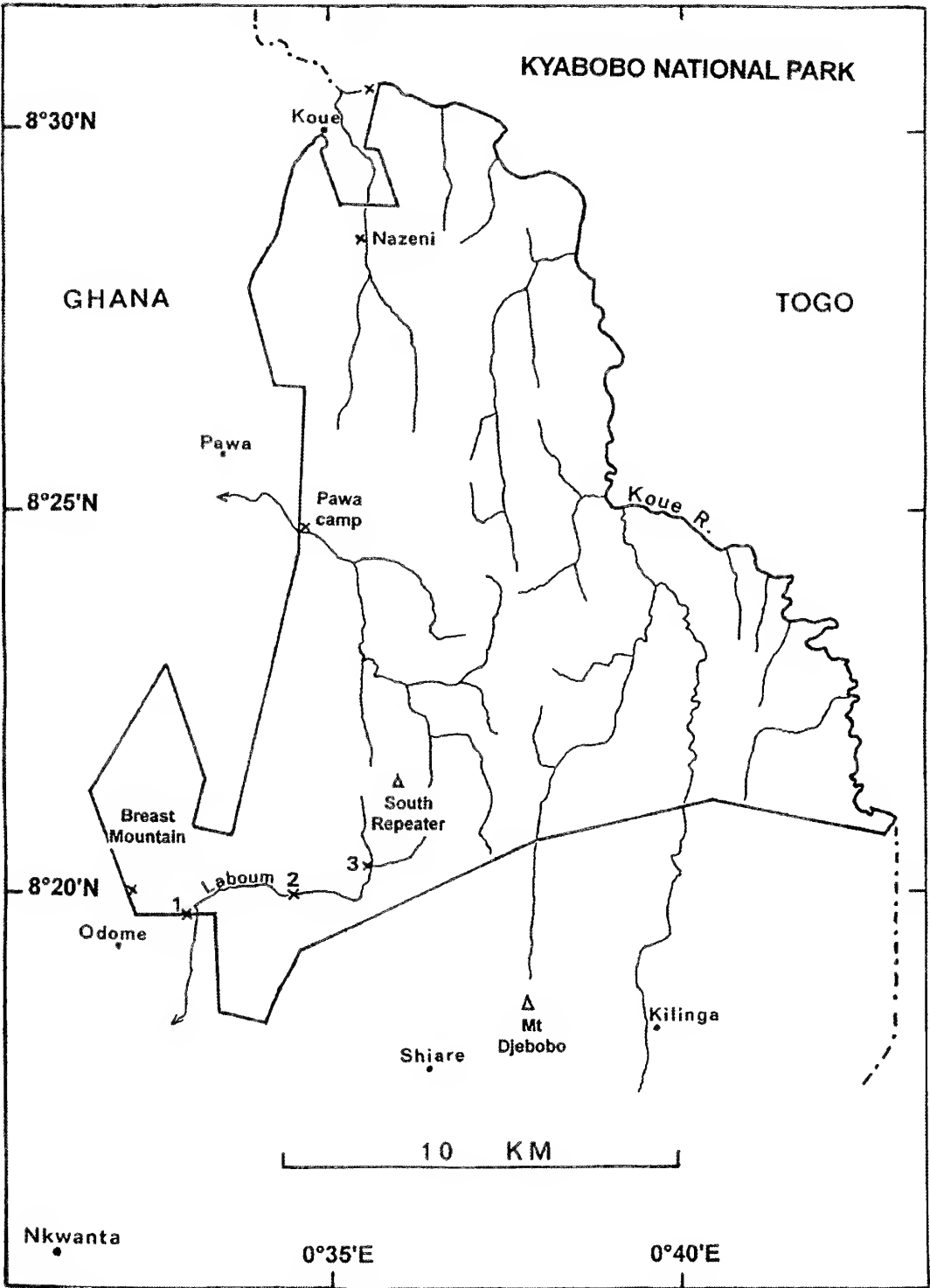


Figure 1. Map of Kyabobo NP showing main localities and all camp sites (crosses); of the latter, 1 = Laboum main camp (outpost), 2 = Laboum forest camp, 3 = upper Laboum valley.

A limited amount of mist-netting was carried out in July: two days in forest on the Laboum stream, and a few hours in farmbrush to catch Baumann's Bulbul *Phyllastrephus baumanni*. Nomenclature follows Dowsett & Forbes-Watson (1993) except for African Green Pigeon *Treron calvus* (Urban *et al.* 1986) and *Spermestes* in place of *Lonchura* (Payne & Sorenson 2003). The suffixes of some species names have changed following David & Gosselin (2002a, b).

Habitats

Arbonnier (2000) and Hawthorne (1990) were used for plant identification. Five habitat types (following White 1983) can be recognized in Kyabobo, from the least to the most forested:

Wooded Grassland (tree cover 10–40%) occurs on some of the ridge tops, with thin, gravely soil or scattered rocks. *Syzygium guineense* is very common on top of "South Repeater", as is the small *Protea madiensis*.

Woodland (tree cover $\geq 40\%$) in the sections visited is most extensive near Koue and Nazeni, with limited areas in the Laboum basin. *Daniellia oliveri* is usually the tallest tree (20–25 m), and other characteristic tree species include *Crossopteryx febrifuga*, *Cussonia arborea*, *Detarium microcarpum*, *Hannoa undulata*, *Isobertia doka*, *Khaya senegalensis*, *Lonchocarpus sericeus*, *Lophira lanceolata*, *Nauclea latifolia*, *Parinari curatellifolia*, *Parkia biglobosa*, *Piliostigma thonningii*, *Prosopis africana*, *Pseudocedrela kotschyi*, *Terminalia laxiflora*, *Uapaca togoensis*, *Vitellaria paradoxa*, *Vitex doniana*. Some figs occur locally (*Ficus ingens*, *F. platyphylla*, *F. sur*). The herbaceous layer is mostly grasses; in some areas (disturbed by agriculture and fires) the exotic shrub *Chromolaena odorata* may be present.

Transition Woodland has a mixture of woodland and forest elements: the open canopy is dominated by woodland species (with a few forest trees) but the understorey is invaded by evergreen vines, as well as *Chromolaena* 2–3 m tall. Transition woodland is very extensive on the slopes of large hills, above the level of forest. Forest trees include *Anthocleista djalensis*, *Bridelia scleroneura*, *Cola gigantea*, *C. millenii*, *Milicia excelsa*, *Spondias mombin*. On the slopes of Breast Mountain, some woodland species (e.g. Baobab *Adansonia digitata* and smaller trees of *Hymenocardia acida*) are being smothered by vines and forest trees growing over and around them.

Dry *Anogeissus* forest is the most characteristic forest type in the region of Koue, occupying valley flats on water-logged soil. *Anogeissus leiocarpus* is deciduous for only a few weeks and forms a closed canopy at a height of 30 m or so. There are numerous herbaceous vines. A few other tree species occur, among them (along streams) *Cola gigantea*, *Ceiba pentandra*, *Erythrophleum suaveolens*, *Ficus ingens*, *Khaya grandifoliola*, *K. senegalensis*.

Semi-evergreen Rain Forest (= dry semi-deciduous rain forest of Hall & Swaine 1976) is extensive in the valleys and lower hill slopes of the south. The canopy

reaches 25–40 m. The boundary between Transition Woodland and this forest type is not always clear-cut. Forest clearings are almost invariably invaded by the exotic *Chromolaena*, apparently largely the result of fires (*Chromolaena* growing faster than natural vegetation). Widespread tree species include: *Azela africana*, *Albizia adianthifolia*, *Canarium schweinfurthii*, *Ceiba pentandra*, *Cleistopholis patens*, *Cola gigantea*, *C. millenii*, *Cordia millenii*, *Detarium senegalense*, *Dialium guineense*, *Diospyros mespiliformis*, *Elaeis guineensis*, *Ficus mucoso*, *F. polita*, *F. sur*, *F. vogelii*, *Hildegardia barteri*, *Homalium letestui*, *Malacantha alnifolia*, *Maranthes kerstingii*, *Pachystela brevipes*, *Parkia filicoidea* (reaching 40 m), *Pentadesma butyracea*, *Piptadeniastrum africanum*, *Pycnanthus angolensis*, *Ricinodendron heudelotii*, *Sorindeia zenkeri*, *Spondias mombin*, *Sterculia tragacantha*, *Symphonia globulifera*. Large woody lianes are present (e.g. *Entada*, *Strychnos*, *Tetracera* sp.) and reach the canopy. Important permanent streams such as the Laboum and the stream at Pawa camp are lined by denser forest, with *Antiaris toxicaria*, *Ceiba*, *Cola gigantea*, *Elaeis*, *Eriocoelum kerstingii*, *Erythrophleum suaveolens*, *Lecaniodiscus cupanioides*, *Myrianthus arboreus*, *Napoleonaea vogelii*, *Pandanus* sp., *Pentadesma butyracea*, stilt-rooted *Uapaca togoensis*, etc.

Only a small percentage of the reserve is cultivated, on flat terrain (valley bottoms, tops of low plateaux). Secondary growth (farmbush) follows cultivation (maize or cassava), the first stage being herbaceous growth 2–3 m tall, with some shrubs; *Elaeis* palms are usually left in fields. The invasive *Chromolaena* is dominant in this landscape. Secondary thickets are another stage of forest regeneration. The exotic bamboo *Bambusa vulgaris* occurs locally in clumps on the lower Laboum; teak *Tectona grandis*, another exotic, regenerates spontaneously in farmbush near Koue (its flowers are highly attractive to sunbirds).

The largest stream, or river, the Koue in the east, was a torrent of brown water in July; it was not revisited in February.

The avifauna

In all, 235 species were recorded, all but three by ourselves, as detailed below. Our July visit produced 182 species, and the shorter February visit 171, 50 being additions. Many of the additions were Palaearctic or intra-African migrants; others were forest birds that had been overlooked previously, some (in the Laboum area visited at both seasons) apparently silent at the peak of the rains, while others were found only in the luxuriant riparian forest at Pawa camp during our second survey. Biomes are indicated where relevant: GC = Guineo-Congolian element (following Dowsett-Lemaire & Dowsett 2001); SUD = Sudanian element (belonging to the Sudanian region of White 1983, synonymous with the “Sudan-Guinea” savanna biome of Fishpool & Evans 2001). The status of migrants is given immediately after the species name: AM = intra-African migrant; PM = Palaearctic migrant.

Ardeidae

Tigriornis leucolopha White-crested Tiger Heron (GC). One seen in forest by the Laboum stream, 27 Jul.

Butorides striata Green-backed Heron. Present on the Koue river, Jul.

Scopidae

Scopus umbretta Hamerkop. One or two by the Koue river, Jul.

Accipitridae

Pernis apivorus Honey Buzzard. PM. Singles, 20 and 23 Feb.

Necrosyrtes monachus Hooded Vulture. Mainly commensal, outside the park. One pair hunting from Odome to Breast Mountain, Jul.

Circaetus cinereus Brown Snake Eagle. One over Laboum basin, Jul, Feb.

Dryotriorchis spectabilis Congo Serpent Eagle (GC). One calling in upper Laboum forest, 20 Feb; seen in same area 22 Feb.

Polyboroides typus Gymnogene. One in upper Laboum basin and another displaying over forest near Pawa, Feb.

Accipiter melanoleucus Black Goshawk. One flying into Laboum forest, Jul.

A. erythropus Red-thighed Sparrowhawk (GC). A species mainly of forest edges, with a few observed near Koue (canopy of *Anogeissus*) and Laboum area, Jul, Feb, including one catching and eating a *Charaxes* butterfly.

A. tachiro African Goshawk. Singles recorded in forest at all sites; display song heard throughout in Jul, also Feb.

Kaupifalco monogrammicus Lizard Buzzard. Throughout the park, in farmbush and savanna. Strongly territorial. Jul, Feb.

Buteo auguralis Red-necked Buzzard. Not seen Jul, but fairly conspicuous (and calling) in Feb in the hills around Laboum and Pawa camps.

Hieraaetus ayresii Ayres's Hawk Eagle. One over Breast Mountain, Jul.

Spizaetus africanus Cassin's Hawk Eagle (GC). Forest species more widespread than last, Jul, Feb: singles or pairs seen near Nazeni camp, Laboum and Breast Mountain, including display song.

Polemaetus bellicosus Martial Eagle. One over hills east of Nazeni camp, 24 Jul.

Falconidae

Falco biarmicus Lanner Falcon. One over hill near Pawa camp, 23 Feb.

Phasianidae

Francolinus bicalcaratus Double-spurred Francolin. Common in savanna grassland, Jul, Feb.

F. ahantensis Ahanta Francolin (GC). Very common in transition woodland, forest and farmbush, Jul, Feb.

Ptilopachus petrosus Stone Partridge. Very common throughout savanna and forest, in pairs or small groups, Jul, Feb.

Numididae

Guttera pucherani Crested Guineafowl. Heard in two places, Jul: near Koue river and one group roosting one night near our Laboum forest camp.

Numida meleagris Helmeted Guineafowl. Uncommon: heard once near Laboum camp (in savanna) and five seen in woodland near Nazeni camp, Jul.

Rallidae

Himantornis haematopus Nkulengu Rail (GC). Tape-recorded at night in riparian forest at Pawa camp, Jun 2005 (S. Bearder *in litt.*, with tape provided).

Sarothrura pulchra White-spotted Flufftail (GC). In tall rank grass, *Chromolaena* and forest near streams: Laboum, Breast Mountain and Pawa camp, Jul, Feb.

Heliornithidae

Podica senegalensis African Finfoot. Heard once on the Laboum stream, Jul, and reported by some scouts on the Koue. Also seen on the stream at Pawa camp, Feb.

Columbidae

Columba delegorguei Bronze-naped Pigeon. One heard in forest near our Laboum forest camp, Jul; evidently more vocal in Feb, with several singing in Laboum forests and one seen.

Streptopelia vinacea Vinaceous Dove. AM. Almost absent in Jul: one immature in savanna at Laboum camp, 12 Jul, but several singing in that area in Feb. Thus mainly a local dry-season breeding visitor.

S. semitorquata Red-eyed Dove. Very common throughout savanna, farmbush with large trees and open forest, Jul, Feb.

Turtur afer Blue-spotted Wood Dove. Common throughout savanna, open forest and secondary thickets, Jul, Feb.

T. tympanistria Tambourine Dove. Common in semi-evergreen rain forest (Laboum to Pawa). Apparently singing less in Feb than Jul.

T. brehmeri Blue-headed Wood Dove (GC). Rare: two singles flushed from understorey in semi-evergreen forest at Breast Mountain, 12 Jul.

Treron calvus African Green Pigeon. Common throughout. Pairs and small groups feeding on fruit of *Ficus* spp., *Bridelia scleroneura*, *Manilkara multinervis*, *Vitex doniana*, Jul, Feb.

Musophagidae

Tauraco persa Guinea Turaco (GC). Very common throughout in forest and woodland, feeding on a variety of fruit (as for *Treron*), Jul, Feb.

Musophaga violacea Violet Turaco (SUD). Small numbers in open situations (farmbush, riparian forest), throughout, Jul.

Corythaeola cristata Great Blue Turaco. Several scouts know this distinctive, noisy bird from wetter forest near Kilinga and Shiare, and assured us that, at times, wanderers visit the forests in the Laboum basin.

Crinifer piscator Western Grey Plantain-eater. A few in savanna and farmbush near Koue; a wanderer near Laboum camp, 15–16 Jul.

Cuculidae

Clamator levaillantii Striped Cuckoo. AM. One calling briefly on ridge near South Repeater, 21 Feb. Normally parasitizes *Turdoides* babblers (absent from Kyabobo), and its status at Kyabobo is unclear.

Pachycoccyx audeberti Thick-billed Cuckoo. One singing in farmbush near Koue river, 18 Jul. Its loud whistled song was imitated frequently by *Turdus pelios* in the Laboum area. Much more conspicuous in Feb, with three different individuals located in the Laboum area, calling persistently.

Cuculus solitarius Red-chested Cuckoo. AM. Very few in the north, near Koue river and Nazeni camp, in forest, singing little (few robins to parasitize and breeding probably over), Jul. None heard in five days in Feb, but one seen near Laboum outpost, 18 Feb.

C. clamosus Black Cuckoo. AM. Several rather noisy birds near Laboum outpost 10–17 Jul (in open forest and transition woodland), silent by late Jul; one calling briefly near Nazeni camp, 23 Jul. One calling (Laboum), 18 Feb. Reported in the Shiare area, Oct (Moyer 1996).

C. gularis African Grey Cuckoo. AM. One seen in woodland near Koue, 20 Jul. One seen and heard in woodland near Laboum outpost, 19 Feb.

Chrysococcyx cupreus Emerald Cuckoo. AM. One singing in forest in the upper Laboum valley, 28 Jul. Apparently absent from the same area in Feb (none in three days).

C. klaas Klaas's Cuckoo. Widespread in woodland, transition woodland and semi-evergreen forest on hills, Jul, Feb.

C. caprius Didric Cuckoo. AM. Nest parasite of weavers, only just in the park near Koue (in farmbush), Jul.

Ceuthmochares aereus Green Coucal. Widespread in small thickets throughout (transition woodland, *Anogeissus* forest, farmbush, hill forest), Jul, Feb.

Centropus leucogaster Black-throated Coucal (GC). Heard once in open forest near Laboum forest camp, Jul. Noisier in Feb, when heard in several places in the Laboum area, also in riparian forest at Pawa camp.

C. monachus Blue-headed Coucal. Several pairs seen in rank growth in farmbush and forest edges in the Laboum valley and one seen near Koue river, Jul, Feb.

C. senegalensis Senegal Coucal. The main coucal species in woodland and farmbush, especially in the north (Koue, Nazeni, near Pawa), but also near Laboum camp and top of Breast Mountain, Jul, Feb.

Tytonidae

Tyto alba Barn Owl. Heard at Laboum, Koue and Nazeni camps, Jul.

Strigidae

Otus senegalensis African Scops Owl. Calling throughout (Jul, Feb), in woodland, transition woodland and open semi-evergreen forest.

Bubo africanus Spotted Eagle Owl. Heard and seen in savanna throughout, Jul, Feb.

B. poensis Fraser's Eagle Owl. Pair duetting with usual guttural trills ("roulades") in riparian forest at Pawa camp, 22 Feb, and high whistle heard several times at the same spot, probably given by immature (cf. Dowsett-Lemaire 2006).

Glaucidium capense Barred Owlet. Several heard from transition woodland and forest edges in the Laboum and Nazeni regions, Jul, as well as on the edge of riparian forest

at Pawa, Feb. In Jul, sometimes called only a little in the early morning. Songs consist of series of 6–8 slightly purred notes and also the longer series of rolled notes (cf. race *etheckopari* recorded in Ivory Coast by Chappuis 2000; sonogram in Dowsett & Dowsett-Lemaire 1993).

Strix woodfordii Wood Owl. Throughout, heard at all camp sites (transition woodland and forest), Jul, Feb.

Caprimulgidae

Caprimulgus pectoralis (nigriscapularis) Fiery-necked Nightjar. Heard from Laboum camp and bottom of Breast Mountain (transition woodland, farmbush, forest clearings), also near Nazeni camp, Jul. Sang on clear nights, at first mainly in the early morning, but vocal activity clearly increasing during Jul. Tape-recorded (at Breast Mountain). More vocal in Feb, when several heard in the Laboum area and around Pawa camp.

C. tristigma Freckled Rock Nightjar. At least one singing on pebbly hill above Pawa camp, 22 Feb. Likely present in any ridge-top woodland with rocks.

C. climacurus Long-tailed Nightjar. AM? Seen and heard in savanna near Laboum camp in Feb (none there Jul), and one seen and heard in small abandoned field at Pawa camp, 22 Feb.

Apodidae

Cypsiurus parvus Palm Swift. Occasional bird seen, Jul.

Apus melba Alpine Swift. PM. Large numbers (> 100) calling over the upper Laboum valley and ridges, 21–22 Feb, sometimes mixed with the next species. Hundreds over a hill above Pawa camp, 23 Feb.

A. aequatorialis Mottled Swift. AM. Several dozens seen at close range and calling with *A. melba* over the Laboum valley, 21–22 Feb.

A. apus European Swift. PM. Several groups associated with swallows in the upper Laboum area, 20–22 Feb.

A. affinis Little Swift. Group over Breast Mountain, 31 Jul (breeds in some villages under eaves and on bridges).

Trogonidae

Apaloderma narina Narina's Trogon. Two located by song in the Laboum forest, Jul.

Alcedinidae

Ceyx pictus Pygmy Kingfisher. AM in part. A few in woodland, farmbush with scattered trees, Jul, Feb.

Halcyon leucocephala Chestnut-bellied Kingfisher. AM. Very common and noisy in Feb (absent Jul) in open woodland or farmbush, especially conspicuous on ridge tops.

H. malimbica Blue-breasted Kingfisher. Widespread and common in all forest types (although less common in *Anogeissus*) and transition woodland, Jul, Feb.

H. chelicuti Striped Kingfisher. Widespread in woodland, Jul, Feb.

Meropidae

Merops pusillus Little Bee-eater. One in farmbush and a group of three in woodland in the south, did not stay, Jul.

M. hirundineus Swallow-tailed Bee-eater. AM. A pair in woodland near Laboum camp, 19 Feb.

M. albicollis White-throated Bee-eater. AM. A group of migrants flying north on 13 Jul is very late for this Sahel-breeding bird. Probably not uncommon in winter: groups feeding in farmbush on upper Laboum, 21–22 Feb.

M. apiaster European Bee-eater. PM. A group near Pawa 23 Feb, probably wintering in the area (as this is a little early for the start of northward passage).

Coraciidae

Coracias cyanogaster Blue-bellied Roller (SUD). Pairs or family units (of four) in several open areas of woodland, often on the edge of fields, Jul, Feb.

Eurystomus glaucurus Broad-billed Roller. AM in part. Near the Laboum stream in farmbush, calling very little in Jul but more conspicuous and noisy in Feb (several pairs from Laboum camp to South Repeater) when often associating with next species.

E. gularis Blue-throated Roller (GC). Blue throat of an adult very well seen when feeding a fledgling in forest above our Laboum forest camp, 25–29 Jul. The young bird had a pale blue, rather mottled belly, and was calling almost constantly (a distinctive high piping note). Much more conspicuous in Feb, when adults frequently gave the typical screams (forest and farmbush in upper Laboum, Pawa camp).

Phoeniculidae

Phoeniculus purpureus Red-billed Wood Hoopoe. Uncommon, with a group of five encountered in woodland near the Laboum stream, 13 Jul.

P. aterrimus Black Wood Hoopoe. Widespread in woodland, transition woodland, and *Anogeissus* forest (canopy), Jul, Feb.

Upupidae

Upupa epops Hoopoe. AM. Reported in the dry season of 2004 (one in woodland near Laboum camp: P. Hartley, pers. comm.) but must be rare.

Bucerotidae

Tropicranus albocristatus White-crested Hornbill (GC). One accompanying a group of Mona Monkeys *Cercopithecus mona* in closed forest near the Laboum waterfalls, 28 Jul.

Tockus fasciatus Pied Hornbill (GC). Very common in all vegetation types, Jul, Feb.

T. nasutus African Grey Hornbill. AM. Very common in Feb, in any woodland; absent Jul–Aug.

Bycanistes fistulator White-tailed Hornbill (GC). Locally common in Koue area, Jul, with local movements, as much commoner in the Laboum area in Feb than Jul.

Lybiidae

Pogoniulus scolopaceus Speckled Tinkerbird (GC). Fairly common in the south, especially the Laboum basin (forest and farmbush), more local on Breast Mountain; wanders short distances away from forest to take figs in woodland, Jul, Feb.

P. chrysoconus Yellow-fronted Tinkerbird. The commonest tinkerbird in woodland in the north (Nazeni-Koue), but outnumbered by *P. bilineatus* in the south. Also in dry *Anogeissus* forest, Jul, Feb.

P. bilineatus Golden-rumped Tinkerbird. Common in all vegetation types in the south, including woodland, Jul, Feb. More local in the north, in riparian forest.

Tricholaema hirsuta Hairy-breasted Barbet (GC). Encountered in secondary forest on the upper Laboum, as well as in riparian forest at Pawa camp, Jul, Feb.

Lybius vieilloti Vieillot's Barbet. Common in woodland, north and south, occasional in farmbush, Jul, Feb.

L. bidentatus Double-toothed Barbet. One pair in farmbush/woodland near Koue, feeding on fruit of *Cussonia* and *Vitex*, 19–20 Jul.

L. dubius Bearded Barbet (SUD). One pair in farmbush near the Koue river, on the park's northern boundary, 21 Jul, very close to *L. bidentatus*.

Trachyphonus purpuratus Yellow-billed Barbet (GC). One responded to tape in secondary forest in the upper Laboum valley, 28 Jul. Calling spontaneously in the same area in Feb.

Indicatoridae

Indicator maculatus Spotted Honeyguide (GC). One in song in secondary forest in the upper Laboum valley, 20–21 Feb.

I. indicator Greater Honeyguide. One seen in canopy of *Anogeissus* forest in the north, Jul.

I. minor Lesser Honeyguide. Several song posts in forest, Laboum to Pawa, Jul, Feb.

I. exilis Western Least Honeyguide. One flycatching in a large tree in riparian forest on the Laboum, 11 Jul.

I. willcocksi Willcocks's Honeyguide (GC). Two exploring bark together in farmbush on the edge of forest near Breast Mountain, 31 Jul. Lack of moustachial stripe noted. One on the edge of riparian forest on the upper Laboum, 22 Feb.

Picidae

Campethera punctuligera Fine-spotted Woodpecker. Rare: one seen in a mixed woodpecker party in transition woodland near Nazeni camp, Jul.

C. cailliautii Little Spotted Woodpecker. Seen once in Jul in a mixed woodpecker party in transition woodland near Nazeni camp. Responded to tape of both *C. cailliautii* and Golden-backed Woodpecker *C. maculosa*. Called repeatedly in tree-top (series of "whee" calls, similar in both species). Tail colour, the main difference in male plumage, was not well seen, but assumed to be this species (reported in the Shiare area by Moyer 1996) rather than *C. maculosa*, which occurs further west in Ghana (Short in Fry *et al.* 1988). Also heard on the upper Laboum (forest edge), 22 Feb.

C. nivosa Buff-spotted Woodpecker (GC). Located in riparian forest at Pawa camp, Feb.

Dendropicos gabonensis Gabon Woodpecker (GC). A pair in forest and farmbush in the upper Laboum valley, seen and heard, Jul, Feb.

D. fuscescens Cardinal Woodpecker. Widespread in farmbush (with thickets), in riparian forest and at edges of woodland, Jul, Feb.

Thripias pyrrhogaster Fire-bellied Woodpecker (GC). Locally common in the Laboum forest, based on the early morning drumming on dead trees: four territories within a few hundred m in forest and adjacent farmbush. Drumming heard Jul, Feb.

Mesopicos goertae Grey Woodpecker. Seen once in a mixed woodpecker party in transition woodland near Nazeni camp, Jul.

Picoides obsoletus Brown-backed Woodpecker. Seen twice in the Laboum area, in thin riparian forest and woodland near camp, Jul.

Hirundinidae

Psalidoprocne obscura Fanti Saw-wing. AM? Several in clearings along the Laboum and Koue rivers in Jul. More numerous locally in Feb: up to 25 birds (Laboum); > 20 birds flying north, 21 Feb. Also reported in the Shiare area, Oct (Moyer 1996).

Hirundo abyssinica Lesser Striped Swallow. Groups up to 20 on several occasions, Jul. Seen once in Feb (Laboum).

H. preussi Preuss's Cliff Swallow. AM. A few well seen, with migratory *Delichon urbicum*, on the upper Laboum, 22 Feb.

H. rustica European Swallow. PM. Some flying north, 21–22 Feb.

H. lucida Red-chested Swallow. AM? A few visiting farmbush over the Laboum stream on occasion, Jul; flocks of 10 or more flying south over hills, apparently on migration, 22 Jul, 1 Aug.

Delichon urbicum House Martin. PM. Common on passage, 20–22 Feb.

Motacillidae

Anthus similis Long-billed Pipit. One pair observed on top of the hill near South Repeater, in short open woodland, 21 Feb. One bird was singing a song typical of the species elsewhere in Africa (two different notes repeated with a short interval “plui, tchlup, plui, tchlup...”) and the other was nest-building. There are several other hills with pebbly, short woodland in Kyabobo.

A. trivialis Tree Pipit. PM. Common migrant in woodland in the dry season, with several in the Laboum valley and on ridge top, 19–22 Feb.

Campephagidae

Campephaga phoenicea Red-shouldered Cuckoo-shrike. AM. Two males chasing each other in farmbush near Koue, 20 Jul.

Coracina pectoralis White-breasted Cuckoo-shrike. Few in tall woodland in the north, Jul.

Pycnonotidae

Andropadus virens Little Greenbul. Widespread, in dense forest understorey, farmbush (including *Chromolaena*) and forest edges. low down, except when feeding on canopy fruit, Jul, Feb.

A. gracilis Little Grey Greenbul (GC). Fairly common in the south, in mid-stratum (usually) of forest, including secondary formations, Jul, Feb.

A. curvirostris Cameroon Sombre Greenbul (GC). Forest understorey (Laboum, Pawa), also in thick growth in farmbush, Jul, Feb. Song, heard in several places, a slow series of three modulated whistles; one bird came to tape playback of a similar motif recorded in Cameroon (nominate race) by Chappuis (2000). The race at Kyabobo is not known; the nominate is said to have been collected at several places in Togo (Cheke & Walsh 1996), while *leoninus* is reported from forest to the west of the Volta (Lowe 1937).

A. gracilirostris Slender-billed Greenbul. A common canopy species of all forest formations (including *Anogeissus*) and even woodland, wandering there frequently in search of fruit, Jul, Feb.

A. latirostris Yellow-whiskered Greenbul. Very common understorey species of all forest types (including *Anogeissus*), throughout, Jul, Feb.

Baeopogon indicator Honeyguide Greenbul (GC). Widespread (usually in the canopy) in all forest types and even transition woodland, Jul, Feb. Often sang in mid-afternoon and other times when other species were quiet. Seen eating fruit of *Antiaris*, Feb.

Chlorocichla simplex Simple Greenbul (GC). Locally in secondary thickets in farmbush between the Koue river and Koue (several in song in Jul), and in *Chromolaena* on edge of riparian forest near Pawa camp, Feb.

Thescelocichla leucopleura Swamp Palm Bulbul (GC). A noisy pair discovered in riparian forest at Pawa camp, 22–23 Feb. At its northern limit of distribution.

Pyrrhurus scandens Leaflove (GC). Common in canopy of all forest types (including *Anogeissus*) and in transition woodland, Jul, Feb. Often one of the first species to sing at dawn.

Phyllastrephus baumanni Baumann's Greenbul (GC). Thanks to a tape of its song made available by R. Demey (obtained in Ivory Coast), this species was located in many places in Jul, usually in dense herbaceous cover close to the ground, in forest clearings and transition woodland but also in farmbush (particularly old cassava fields invaded by tall grass and *Chromolaena odorata*), and even a field of 2-m tall maize on the edge of the Koue river in the north. Occasionally perched in a shrub or small tree when alarmed, but fed close to the ground, hopping from stem to stem. In transition woodland or forest clearings usually found with *Ptilopachus petrosus*, *Tchagra australis*, *Cisticola lateralis*, *Camaroptera brachyura* and *Andropadus virens*. Near streams it also associated with *Sarothrura pulchra*, *Sylvietta virens*, *Hylia prasina*, *Melocichla mentalis* and *Cisticola erythrops*. In dry farmbush usual associates were *P. petrosus*, *C. lateralis*, *C. brachyura* and *A. virens*. The male of a pair was netted and ringed in farmbush on the Laboum stream and retrapped in another net the same afternoon: a territory of several hectares. Not very vocal in Jul, but more so in Feb after the first storms: the song motifs consist usually of 3–4 notes, at the rate of c. 2 notes per s, either of the *Pycnonotus* type (“tchic, tchup”) or rolled (“prrrur”): thus “tchic-tchup-prrrur-prrui...”; these and variations were given for spells of a few minutes, with short intervals; tape-recorded. Most singing took place at dawn, and occasionally during the day, especially when feeding in a bird party. Alarm call a prolonged churr. The ringed bird was even singing in the net the second time it got caught.

P. icterinus Icterine Greenbul (GC). One bird in a small party in forest with *Tropicranus albocristatus* and *Cercopithecus mona*, 28 Jul. Not relocated in Feb, when the forest looked less suitable (very dry and some trees were leafless), despite the fact we spent more time in the forested Laboum basin.

P. albigularis White-throated Greenbul (GC). Overlooked in Jul, but quite noisy in Feb when fairly common in the dense understorey of secondary forest in the upper Laboum valley, and in riparian forest at Pawa camp.

Bleda canicapillus Grey-headed Bristlebill (GC). Thinly distributed in farmbush and riparian forest (Laboum, Pawa), Jul, Feb; one seen roosting in a clump of exotic *Bambusa vulgaris* (Laboum).

Criniger calurus Red-tailed Greenbul (GC). Widespread in forest (Laboum and Pawa), including secondary formations, Jul, Feb.

Pycnonotus barbatus Common Bulbul. Widespread and common in all habitat types, except shaded understorey of closed-canopy forest, Jul, Feb.

Nicator chloris Western Nicator (GC). Common in all forest types (including *Anogeissus*) and transition woodland with thickets and vine tangles, Jul, Feb. Usually at mid-levels.

Turdidae

Stizorhina fraseri (*finschi*) Rufous Ant Thrush (GC). Very local in forest (Laboum, Pawa), Jul, Feb; singing in Feb.

Turdus pelios West African Thrush. Common and widespread, all habitats except closed forest, Jul, Feb.

Alethe diademata Fire-crested Alethe (GC). Overlooked in Jul. Several singing or calling in forest along the upper Laboum stream, Feb.

Stiphrornis erythrothorax Forest Robin (GC). Several holding territory in Marantaceae understorey along the Laboum in forest, Jul. Surprisingly they sang like Forest Scrub Robin *Erythropygia leucosticta* and reacted only to tapes of that bird, not to the shorter motif of their own species recorded in Ivory Coast (Chappuis 2000). Two were netted, using the tape of *E. leucosticta* as a lure. They appeared absent from this spot, which was too dry, in Feb, but were calling in more sheltered forest next to the upper Laboum stream, and one was singing in riparian forest at Pawa camp. The possible confusion between this robin and *E. leucosticta* was encountered elsewhere in south-west Ghana, especially in Kakum, where tape playback of *Erythropygia* song provoked *Stiphrornis* to react strongly. In Equatorial Guinea, *Stiphrornis* sings like the Zambian dialect of Bocage's Robin *Sheppardia bocagei* (Dowsett-Lemaire & Dowsett 1999). Further east, the yellow-bellied race *xanthogaster* produces a semi-continuous light, hurried song very similar to that of White-bellied Robin *Cossyphicula roberti* (Dowsett-Lemaire 1990), and reacts strongly to tapes of the latter. Why *Stiphrornis* shows such wide vocal variation, including almost perfect imitations of or vocal convergence with other robins of different genera, remains mysterious.

Luscinia megarhynchos Nightingale. PM. Some calling and singing in thick *Chromolaena* near the Laboum stream, 18–22 Feb.

Cossypha cyanocampter Blue-shouldered Robin (GC). One calling and singing in sheltered riparian forest at Pawa camp on 22 Feb.

C. niveicapilla Snowy-crowned Robin-Chat. AM in part. In Jul, restricted to secondary thickets in farmbush near the Koue river (some with Teak *Tectona grandis*) with *Chlorocichla simplex* and *Laniarius aethiopicus*. In Feb appeared more widespread, with some also in the Laboum basin (riparian forest, *Chromolaena* on

slopes) and in riparian forest at Pawa camp. The population is probably augmented in the dry season by migrants from the northern savannas.

Cercomela familiaris Familiar Chat. Normally confined to rocky woodland but seen twice in fields in Jul (one very close to a rocky hill). In Feb one pair in burnt woodland on ridge top.

Sylviidae

Melocichla mentalis African Moustached Warbler. Common in tall grass, farmbush or edge of woodland, especially near streams (e.g. Laboum), Jul, Feb. In the dry season tends to restrict itself to unburnt patches.

Hippolais polyglotta Melodious Warbler. PM. Common wintering species in farmbush and woodland in Feb, with much singing activity.

Eremomela pusilla Green-backed Eremomela (SUD). Widespread in small numbers in woodland, locally also in transition woodland (Breast Mountain), Jul, Feb.

Sylvietta virens Green Crombec (GC). Locally common in moist secondary growth (including farmbush) near streams, understorey of transition woodland and open semi-evergreen forest, even small valley-bottom thickets in *Anogeissus* forest, Jul, Feb.

S. brachyura Northern Crombec. Jul, Feb; a pair in farmbush between Nazeni camp and Koue; in woodland near Pawa camp.

Macrosphenus concolor Grey Longbill (GC). Only in sheltered riparian forest at Pawa camp, one singing, 23 Feb.

Phylloscopus trochilus Willow Warbler. PM. Common in woodland, farmbush and secondary forest, with several in song, Feb.

P. collybita Common Chiffchaff. PM. More local than last: some in woodland near Laboum camp, 18 Feb.

Hyliota flavigaster Yellow-bellied Hyliota. Fairly conspicuous in woodland and open riparian forest in the Laboum and Nazeni areas, Jul.

Hylia prasina Green Hylia (GC). In thick understorey of riparian forest, thickets in farmbush (especially near the Laboum stream), forest clearings on slopes; more local near Koue (Nazeni stream, thickets) and Pawa, Jul, Feb.

Sylvia borin Garden Warbler. PM. Several singing in farmbush and at forest edges, Feb.

Cisticolidae

Cisticola brachypterus Short-winged Cisticola. Regularly encountered in short, open woodland, especially where grass cover is not (or little) invaded by *Chromolaena*, Jul, Feb.

C. aberrans Rock-loving Cisticola. Several in rocky grassland with few trees on the ridge of a hill near Koue, Jul.

C. lateralis Whistling Cisticola. The most numerous and widespread cisticola, in woodland, transition woodland, farmbush and clearings in forest. Sings high in trees but feeds much in grass (in the rains) and *Chromolaena*, Jul, Feb.

C. erythrops Red-faced Cisticola. In tall grass (e.g. *Pennisetum*) near streams (Laboum and Koue), also in grass mixed with *Chromolaena*, Jul, Feb.

C. cantans Singing Cisticola. More local than *C. lateralis*, in grass and shrubs in woodland, edge of farmbush, Jul, Feb.

Prinia subflava Tawny-flanked Prinia. Very common in grass/shrubs in woodland and transition woodland, small thickets in farmbush, Jul, Feb.

Heliolais erythropterus Red-winged Warbler. Several pairs in tall grass in open woodland, edge of transition woodland (in the foothills) and farmbush, Jul, Feb.

Apalis sharpii Sharpe's Apalis (GC). In rain forest near the Laboum waterfalls and along the upper Laboum, even in degraded riparian forest next to farms there. In canopy and mid-stratum. Also in riparian forest at Pawa camp. Vocal in Jul and Feb.

Camaroptera brachyura Bleating Bush Warbler. Very common in rank growth and thickets, understorey of *Anogeissus* forest. Well adapted to *Chromolaena* in woodland, farmbush and open forest, Jul, Feb.

C. supercilialis Yellow-browed Camaroptera (GC). Missed in Jul; in Feb at least two singing in secondary forest on the upper Laboum, as well as in riparian forest at Pawa camp.

C. chloronota Olive-Green Camaroptera (GC). Not singing or reacting to tape in Jul and would have been overlooked but for one netted in Marantaceae cover at our Laboum forest camp. In Feb was singing in secondary forest on the upper Laboum as well as in riparian forest at Pawa camp.

Hypergerus atriceps Oriole-Warbler (SUD). Heard in only two places in thin riparian forest on the Laboum, 11–13 Jul.

Muscicapidae

Bradornis pallidus Pallid Flycatcher. A few records in open, short woodland, and farmbush with large trees, Jul, Feb.

Fraseria ocreata Forest Flycatcher (GC). One pair on the edge of riparian forest at Pawa camp, 22 Feb.

F. cinerascens White-browed Forest Flycatcher (GC). One pair (no brood patch) netted in deep shade next to the stream at our Laboum forest camp, 27 Jul. Unusual habitat (normally in seasonally flooded or swamp forest), thus possibly post-breeding wanderers.

Ficedula hypoleuca Pied Flycatcher. PM. Common in any woodland and farmbush, Feb.

Muscicapa striata Spotted Flycatcher. PM. A few in woodland near ridge tops, on 20–21 Feb. These birds were almost unstreaked on the underparts (*balearica*?) and had a rather dark bill. However, calls and behaviour typical of this species, ruling out Gambaga Flycatcher *M. gambagae*.

M. caerulescens Ashy Flycatcher. Scattered records of pairs on edge of riparian forest, woodland with farmbush, Jul.

Myioparus plumbeus Lead-coloured Flycatcher. The most common flycatcher, in woodland, transition woodland, edge of riparian forest, and farmbush with trees, Jul, Feb.

Platysteiridae

Megabyas flammulatus Shrike-Flycatcher (GC). Normally local and rare, but rather conspicuous in Kyabobo, in canopy of large and medium-sized trees in forest

(Laboum to Pawa) and rich transition woodland (Breast Mountain), Jul, Feb. In pairs or small family units of four birds.

Batis senegalensis Senegal Batis. Widespread in woodland in small numbers; also in farmbush with scattered trees, Jul, Feb.

Dyaphorophya blissetti Red-cheeked Wattle-eye (GC). Several pairs in thickets in secondary forest on the edge of farmbush in the upper Laboum valley. Very vocal Jul and Feb, feeding low in dense bush. Also in riparian forest at Pawa camp.

D. castanea Chestnut Wattle-eye (GC). Completely silent in Jul, with one pair seen in forest understorey (Laboum). A few calling in Feb (Laboum and Pawa).

Monarchidae

Terpsiphone viridis African Paradise Flycatcher. Fairly common in all habitat types (woodland, thickets, farmbush and forest), Jul, Feb.

Timaliidae

Illadopsis fulvescens Brown Illadopsis (GC). Common in Laboum forest (understorey tangles), dense secondary forest and forest regrowth a few metres high, and riparian forest at Pawa camp, Jul, Feb.

I. puveli Puvel's Illadopsis (GC). Similarly widespread (Laboum to Pawa), but somewhat more frequent near streams, in forest and tall secondary growth. Singing Jul and Feb.

Phyllanthus atripennis Capuchin Babbler (GC). Missed in Jul, but two or three noisy groups found in Feb in dense understorey of secondary and riparian forest on the upper Laboum, and in riparian forest at Pawa camp.

Paridae

Parus leucomelas (guineensis) White-winged Black Tit. A few pairs in woodland, Jul.

Certhiidae

Salpornis spilonotus Spotted Creeper. Seen twice in woodland (Laboum and Nazeni), Jul.

Nectariniidae

Antheptes fraseri Fraser's Sunbird (GC). A pair in a mixed party in forest on the upper Laboum, 28 Jul. Not found in Feb, perhaps a rains visitor.

A. longuemarei Violet-backed Sunbird. A pair in woodland near Koue, Jul.

A. rectirostris Yellow-chinned Sunbird (GC). One male seen well in tall riparian forest on the Laboum, 11 Jul.

A. collaris Collared Sunbird. Common in all forest types, transition woodland and farmbush, feeding at all levels, Jul, Feb.

Nectarinia seimundi Little Green Sunbird (GC). Laboum forest: three in a party, and a family with fledgling, Jul.

N. olivacea Olive Sunbird. Common in all forest types (including *Anogeissus*), locally in transition woodland, Jul, Feb. Some defending patches of *Symphonia* flowers.

N. verticalis Green-headed Sunbird. A few in riparian forest and mango trees on the Koue river. Also in riparian forest at Pawa camp, Jul, Feb.

N. senegalensis Scarlet-chested Sunbird. One in non-breeding dress, in woodland near Laboum outpost, 12 Jul.

N. adelberti Buff-throated Sunbird (GC). Locally common in farmbush with big trees, and secondary forest. Defending patches of *Symphonia* and mistletoe flowers, Jul, and often on flowers of *Parkia filicoidea*, Feb.

N. venusta Yellow-bellied Sunbird. Two in farmbush near Nazeni camp, 23 Jul (one coming into breeding dress). More widespread in Feb, often feeding on flowers of *Parkia filicoidea*.

N. chloropygia Olive-bellied Sunbird. A few in farmbush and secondary growth in the south, Jul.

N. cuprea Coppery Sunbird. Fairly common in woodland in the north, also in farmbush (feeding on Teak flowers). Fewer in the south (woodland), Jul, Feb.

N. coccinigastra Splendid Sunbird (SUD). The most common sunbird, in woodland, farmbush, transition woodland and open stands of forest, Jul, Feb. Defended patches of mistletoes.

N. superba Superb Sunbird (GC). Three sightings, edge of riparian forest/farmbush (Laboum), Jul, Feb.

Zosteropidae

Zosterops senegalensis Yellow White-eye. Uncommon in the south (woodland, farmbush), more common in the north, including *Anogeissus* forest, Jul, Feb.

Oriolidae

Oriolus auratus African Golden Oriole. Widespread in canopy of woodland, transition woodland, riparian and open semi-evergreen forest, as well as *Anogeissus* forest, Jul, Feb.

O. nigripennis Black-winged Oriole (GC). Widespread in forest canopy (Laboum, Pawa), singing far more in Feb than Jul.

Malaconotidae

Nilaus afer Brubru. Occasional in woodland, Jul.

Dryoscopus gambensis Northern Puffback. Common in woodland, transition woodland, farmbush with trees or thicket clumps, Jul, Feb.

Tchagra minutus Marsh Tchagra. Local in tall rank grass with shrubs, in farmbush near the Laboum and Nazeni streams, Jul.

T. australis Brown-headed Tchagra. Widespread in dense grass and *Chromolaena*, and in shrubs of forest clearings and transition woodland, more local in similar habitat in farmbush, Jul, Feb.

T. senegalus Black-crowned Tchagra. Very common in woodland, also in farmbush, Jul, Feb.

Laniarius aethiopicus Tropical Boubou. Several pairs in secondary thickets in farmbush between Koue and the river; also once near the Laboum stream, Jul.

Malaconotus multicolor Many-coloured Bush Shrike. One heard in a forest gully beyond South Repeater, 19 Feb (with *M. lagdeni*).

M. lagdeni Lagden's Bush Shrike. One heard and seen in forest on the Laboum stream, 19 and 22 Feb; another heard in an inaccessible forest gully beyond South Repeater, 19 Feb. Our attention was drawn by the song, a series of 4–5 identical soft whistles at

the rate of 1 per s. Each whistle was slightly rising in pitch. Ivory Coast and Rwanda populations (all in Chappuis 2000) produce a somewhat different dialect. Whistling the local dialect stimulated much searching behaviour and some aggressive dry rattles, while the bird stopped singing each time for 10–15 minutes, 19 and 22 Feb. Playback of the Ivory Coast tape, particularly the series of monotonous whistles, also produced a dry rattle, despite the differences in motif. The bird was silent there in Jul. *M. blanchoti* Grey-headed Bush Shrike. Few in canopy of woodland (Nazeni, Pawa) and in thin riparian forest on the Laboum, Jul, Feb.

Prionopidae

Prionops plumatus White Helmet Shrike. Particularly common in the canopy of *Anogeissus* forest in the north, Jul. Local in woodland, farmbush and semi-evergreen forest (near Breast Mountain); groups often of 8–12.

P. caniceps N. Red-billed Helmet Shrike (GC). One seen in a mixed party in semi-evergreen forest above the Laboum waterfalls, 15 Jul. Not relocated in Feb.

Dicruridae

Dicrurus ludwigii Square-tailed Drongo. Several in forest in the upper Laboum basin. More vocal in Feb than Jul.

D. adsimilis Fork-tailed Drongo. Widespread in small numbers in woodland, transition woodland, *Anogeissus* forest (canopy) and farmbush with some tall trees, Jul, Feb.

Corvidae

Corvus albus Pied Crow. Once visited our camp at Laboum, Jul.

Sturnidae

Lamprotornis chloropterus Lesser Blue-eared Starling. AM. Several in woodland in the Laboum area, Feb. Singing and alarm-calling.

L. splendidus Splendid Starling. AM. Quite common and noisy in forest and farmbush in the Laboum basin, also at Pawa camp, Feb. Absent Jul.

Cinnyricinclus leucogaster Violet-backed Starling. AM. A few in farmbush between Koue and the river, all independent immatures and females, 20–21 Jul.

Passeridae

Petronia dentata Bush Petronia (SUD). AM. Common in woodland in Feb (e.g. Laboum, Pawa), absent Jul.

Ploceidae

Ploceus nigricollis Black-necked Weaver. A few pairs in secondary thickets and riparian vegetation on the Koue river, Jul.

P. cucullatus Village Weaver. Small numbers in farmbush near the Koue river, Jul.

P. nigerrimus Vieillot's Black Weaver (GC). Small numbers in farmbush in the upper Laboum valley, Feb, and near the Koue river, Jul, with some nests in *Pennisetum*.

P. superciliosus Compact Weaver. Two groups, of three and five birds, in tall grass and *Chromolaena* in farmbush south of Laboum camp and near Odome, Jul.

Malimbus nitens Blue-billed Malimbe (GC). Conspicuous in mixed bird parties in thick riparian growth/secondary forest on the upper Laboum stream, Jul, Feb.

Anaplectes rubriceps Red-headed Weaver. Several (including immatures) in canopy of *Anogeissus* forest in the north, accompanying *Prionops plumatus* and *Dicrurus adsimilis*, Jul.

Quelea erythrops Red-headed Quelea. AM? Flocks in woodland near Pawa camp, 22 Feb.

Euplectes macroura Yellow-mantled Whydah. Males holding territories of extensive grassland in woodland clearings in two places in the north (on the park's boundary), Jul.

Estrildidae

Nigrita canicapillus Grey-crowned Negrofinch. Common in farmbush, thickets, secondary forest, riparian and semi-evergreen forest, at all levels and throughout, Jul, Feb.

N. luteifrons Pale-fronted Negrofinch (GC). One or two in farmbush on the upper Laboum, as well as on the edge of riparian forest at Pawa camp, 20–23 Feb, in association with *N. canicapillus*. Located by characteristic contact calls, of four descending whistles “fue-fee-fee-fee”; this call, more simple than the song, appears not to have been tape-recorded even though it is the most frequent vocalization (pers. obs. in Congo and elsewhere).

N. bicolor Chestnut-breasted Negrofinch (GC). One in riparian forest at Pawa camp, 22 Feb.

N. fusconotus White-breasted Negrofinch (GC). Two in a mixed party in forest canopy (Laboum), 15 Jul.

Pytilia hypogrammica Yellow-winged Pytilia (SUD). A male in Marantaceae understorey of riparian forest on the upper Laboum, 19 Feb.

Spermophaga haematina Western Bluebill (GC). Occasional pair in rank growth in farmbush and riparian forest on the Laboum stream, Jul, Feb.

Lagonosticta rufopicta Bar-breasted Firefinch (SUD, when split from Brown Firefinch *L. nitidula*). Several pairs in secondary thickets and farmbush near the Koue river and Laboum stream, Jul, Feb.

L. rara Black-bellied Firefinch (SUD). Several pairs in rank growth (farmbush, edge of riparian vegetation), Koue to Laboum, Jul, Feb.

L. rubricata Blue-billed Firefinch. Isolated pairs in Jul (woodland, farmbush), with local concentrations of several dozens in rank grass (partly burnt) on the Laboum stream in Feb.

Estrilda melpoda Orange-cheeked Waxbill. A few small groups in tall grass and rank growth in woodland and farmbush, road edges, Jul, Feb.

Spermestes cucullata Bronze Mannikin. Widespread in small numbers in grass in open woodland and farmbush, Jul, Feb.

S. bicolor Black-and-White Mannikin. Widespread in small numbers in grass in open woodland and farmbush, Jul, Feb.

Viduidae

Vidua macroura Pin-tailed Widow. Some in breeding dress, holding territory in woodland clearings and farmbush on the park's northern boundary, Jul.

V. togoensis Togo Paradise Widow (SUD). One male in breeding dress and two females nearby, in transition woodland near Laboum camp, 18 Feb. This is very late for a bird that breeds mainly at the end of the rains. Parasitizes *Pytilia hypogrammica* (Payne in Fry & Keith 2004).

Fringillidae

Serinus mozambicus Yellow-fronted Canary. Three observations of a pair in woodland, Jul, Feb.

Emberizidae

Emberiza cabanisi Cabanis's Bunting. One singing in ridge-top woodland near South Repeater, 22 Feb.

Breeding records and calling seasonality

Back-dating to egg-laying, where possible, suggests a concentration of breeding activity in the late dry season and early rains.

Eurystomus gularis. Fledgling fed by adults 25–29 Jul (= laying c. Apr–May).

Tockus fasciatus. Some family groups, with noisy juvenile (seemed recently independent), Jul.

Anthus similis. One nest-building, mate singing nearby, 21 Feb.

Turdus pelios. Adult carrying food, 19 Jul.

Sylvietta virens. Pair feeding two fledglings, 14 Jul (= laying May–Jun).

Hyliota flavigaster. Pair with full-grown dependent fledgling, 14 Jul; another with almost independent fledgling, 23 Jul (= laying May).

Cisticola brachypterus. Full-grown juvenile with adult, 14 Jul (= laying probably May).

Cisticola lateralis. Full-grown juvenile with adult, 19 Jul (= laying probably May).

Heliolais erythropterus. Nest-building, 24 Jul.

Myioparus plumbeus. Male singing and carrying food to nest (in a *Vitellaria*), 12 Jul (= laying Jun).

Batis senegalensis. Two females begging from male (*i.e.* incubating), 12 Jul, 1 Aug (= laying late Jun to Jul).

Anthreptes collaris. Several females feeding fledglings, Jul (= laying May to early Jun). Four adults netted Jul were in fresh plumage, one just finishing moult.

Nectarinia seimundi. One feeding fledgling, 28 Jul (= laying Jun).

Nectarinia olivacea. Fledgling begging but nearly independent, 20 Jul; another fledgling fed, 25 Jul (= laying May and Jun). Seven netted adults were in fresh plumage.

Nectarinia coccinigastra. Female feeding nestlings (nest on a hanging branch of *Daniellia oliveri*), 20 Jul (= laying Jun or early Jul).

Tchagra minutus. Female carrying food, 14 Jul (= laying June).

Ploceus nigricollis. Juvenile begging from female, 18 Jul (= laying May); male nest-building same day.

Many resident species were calling at both seasons, but many called more in Feb than Jul. Forest species that appeared to be silent in Jul include *Phyllastrephus*

albigularis, *Stizorhina fraseri*, *Alethe diademata*, *Camaroptera superciliaris*, *C. chloronota*, *Dyaphorophya castanea*, *Phyllanthus atripennis*, *Malaconotus lagdeni*. Others were not entirely silent in Jul, but much more vocal in Feb: *Columba delegorguei*, *Pachycoccyx audeberti*, *Centropus leucogaster*, *Eurystomus gularis*, *Oriolus nigripennis*, *Dicrurus ludwigii*. On the other hand, *Apaloderma narina* was heard only in Jul, as also *Chrysococcyx cupreus*, the latter being probably a rains visitor this far north in Ghana.

Discussion

Biome-restricted species

The Sudanian biome is represented by only 11 species. The transitional nature of the area is well illustrated by the occurrence of both the northern (Sudanian) *Lybius dubius* and the southern *L. bidentatus* (a species of forest edges) (Fig. 2).

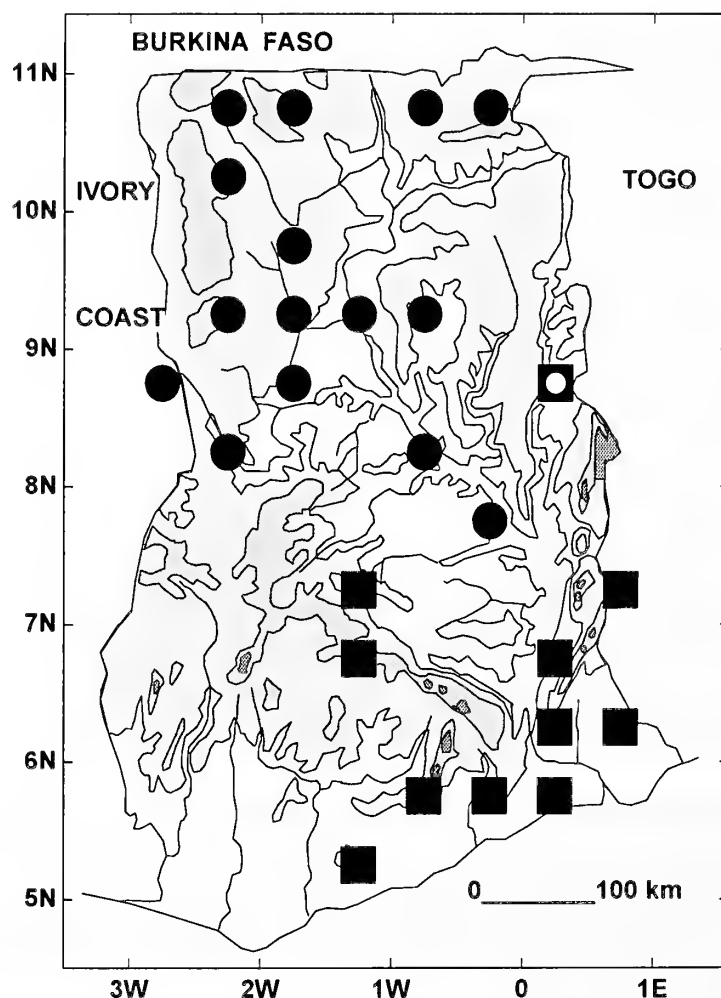


Figure 2. Records of Bearded Barbet *Lybius dubius* (circles) and Double-toothed Barbet *L. bidentatus* (squares) in Ghana: both occur at Kyabobo.

By far the most important biome is Guineo-Congolian, with at least 65 species. Following Fishpool & Evans (2001), another four would be included: *Columba iriditorques* split from *C. delegorguei*, nominate *Bubo poensis* separated from the Tanzanian taxon *vosseleri*, *Caprimulgus (pectoralis) nigriscapularis* and *Psalidoprocne obscura*. The last two should, however, be best considered as linking elements between the Guineo-Congolian and Sudanian regions, as they are widely distributed in savanna regions as well. Five GC species are Upper Guinea endemics or near-endemics (Dowsett-Lemaire & Dowsett 2001): *Fringilla ahandensis*, *Thripias pyrrhogaster*, *Phyllastrephus baumanni*, *Bleda canicapillus*, *Apalis sharpii*. Although most GC forest species are found in the predominant semi-evergreen rain forest, several occur in drier forest types (including *Anogeissus* forest), transition woodland and farmbush, and some frugivores (e.g. *Tauraco persa*, *Tockus fasciatus*, *Pogoniulus scolopaceus*) readily visit fig trees in woodland.

Biogeographical importance of Kyabobo

As the area was virtually unexplored, all observations of forest birds (including all GC species) represent extensions of known range in Ghana. The more striking examples of northern extensions for forest species concern *Dryotriorchis spectabilis*, *Accipiter erythropus*, *Spizaetus africanus*, *Turtur brehmeri*, *Bubo poensis*, *Eurystomus gularis*, *Indicator maculatus*, *I. willcocksii*, *Campethera nivosus*, *Dendropicos gabonensis*, *Thripias pyrrhogaster*, most of the forest bulbuls (e.g. all three *Phyllastrephus*), various *Turdidae* (e.g. *Alethe diademata*) and *Sylviidae* (e.g. *Apalis sharpii*, *Macrosphenus concolor*), *Fraseria* (both species), *Megabyas*, *Dyaphorophya*, spp., *Phyllanthus atripennis*, *Illadopsis* spp., various sunbirds, both *Malaconotus* (see below), and all four *Nigrita* spp. Only a few of these forest birds were known from the poorly prospected adjacent Fazao-Malfakassa NP in Togo (Cheke & Walsh 1996), e.g. *Spizaetus africanus*, *Indicator maculatus* and *Thescelocichla leucopleura* (the only forest bulbul mentioned for Fazao by Cheke & Walsh 1996).

In the case of *Glaucidium capense*, new to Ghana, the nearest record hitherto of this bird was from Lamto (6°13'N, 5°2'W) in Ivory Coast (Collar & Stuart 1985), some 700 km to the west. But in further surveys throughout Ghana in 2005 we found it in another six localities, from Bui NP to Wli Falls and Shai Hills, including Kogyae Reserve where it was tape-recorded. Some of the birds (initially silent) were provoked into song by play-back. This owl is characteristic of the forest-savanna transition zone, occurring in *Daniellia* transition woodland and at forest edges. Other forest species whose ranges are extended include *Fraseria cinerascens*, known previously no nearer than Akropong in Akwapim (Grimes 1987, 250 km to the south-west), and also found by us in Kogyae on the Afram river (7°10'N, 1°7'W) in Jan 2005. *Illadopsis puveli* was confused by Grimes (1987) with the much rarer *I. rufescens*: a tape-recording of "*I. rufescens*" from coastal thickets was re-identified as *I. puveli* (Chappuis 1975, pers. obs.), and other records are similarly in error. *I. puveli* is in fact

the most widespread illadopsis in Ghana, from coastal thickets north to Kyabobo and Bui NP (Dowsett-Lemaire & Dowsett 2005). Even for savanna or forest-edge species like the nightjar *Caprimulgus (pectoralis) nigriscapularis* the range extension is considerable, as it was known only from Cape Coast (Grimes 1987, A. Riley unpubl.), 370 km to the southwest, but we have recently found it in another nine localities. In the case of *Ploceus superciliosus* the previous nearest record seems to be from the Keta Plains (c. 6°15'N, 0°45'E) (Grimes 1987). The Thick-billed Cuckoo *Pachycoccyx audeberti* (rarely reported in Upper Guinea) was previously known from just three places in the Volta region (Grimes 1987), but as well as at Kyabobo, we found it also at many other localities in Ghana in 2004–5 (Dowsett-Lemaire & Dowsett 2005) and it is especially frequent in the forest–savanna transition zone.

Our observations of *Malaconotus lagdeni* are the first in Ghana since the type specimen was collected in “Ashanti”, supposed to be in forest near Kumasi where G. Lagden was operating in the 1880s (Hall *et al.* 1966). This bird is extremely rare or localized in W Africa: in recent years it has been discovered at a few forest localities in Liberia (Gatter 1997), Sierra Leone (Allport *et al.* 1989, pers. obs.) and Ivory Coast (Thiollay 1985). It is also known from a small isolated population in the Albertine Rift of E Democratic Republic of Congo (Congo-Kinshasa: Chapin 1954) and Rwanda (Dowsett-Lemaire 1990). From Togo there is an undocumented sight record from the “Pagala-Ghana” road near the Ghana border at 8°11'N (cited by Cheke & Walsh 1996 but disregarded by Borrow & Demey 2001, 2004), just opposite Nkwanta and very close to the Kyabobo forests. No doubt this and our own observations refer to the same population on the Togo Plateau.

The GC forest species and some other forest birds found in Kyabobo can go no further north in E Ghana, as the landscape changes dramatically into dry savanna within a few km of the park's northern boundary. Even in the south of the reserve, in the relatively wet Laboum basin, several forest birds appeared to be at their range limits: in particular *Phyllastrephus icterinus* and *Prionops caniceps*, observed as single (silent) members of mixed bird parties in Jul, and not relocated in Feb, when the forest was very dry and several tree species temporarily leafless. These and a few other birds may be local wanderers from denser, wetter forest to the south, as in the Shiare or Kilinga region. The hills to the south of the park are more densely forested than within it. From forest a few km south of Shiare, Moyer (1996) reported three species as yet unknown in Kyabobo: Olive Long-tailed Cuckoo *Cercococcyx olivinus*, Rufous-sided Broadbill *Smithornis rufolateralis* and Black-and-White Flycatcher *Bias musicus*; he also recorded Red-collared Whydah *Euplectes ardens*, a species of tall rank grass that seems likely to occur somewhere in Kyabobo. A few more forest species have been found in the poorly-explored Fazao-Malfakassa NP in adjacent Togo (Cheke & Walsh 1996), noteworthy being the rare Black-and-White Casqued Hornbill *Bycanistes subcylindricus* and Yellow-casqued Hornbill *Ceratogymna elata* (the former was omitted from the biome table in the Koue valley Important Bird Area account: Cheke 2001), and White-tailed Ant Thrush *Neocossyphus poensis* (seen near

the Koue river). The Forest Francolin *Francolinus lathamii* has been reported (H. Lege in Cheke & Walsh 1996), but how it was identified is not stated. It is still unreported from anywhere in E Ghana. Another three species mentioned by Cheke & Walsh (1996) for Fazao come from an unpublished report ("Minster Agriculture Limited 1984") and ought to be queried: one (Blue-headed Crested Flycatcher *Trochocercus nitens*) does not even appear in the report's list, while the main author of the report (J.M. Lock *in litt.*) considers another two (Sooty Boubou *Laniarius leucorhynchus*, Dusky Blue Flycatcher *Muscicapa comitata*, which have never been reported from E Ghana or elsewhere in Togo) very doubtful.

Of the non-forest species, of special interest is *Anthus similis*, of which a pair was found nesting in short, open pebbly woodland at an altitude of >800 m. There are very few records of this bird in Ghana, where it is confined to the highlands in the Amedzofe area north to 7°49'N on the Togo border (Taylor & Macdonald 1989, Cheke & Walsh 1996). Kyabobo represents a small extension to the north; no specimens of this population exist, and the birds appear to be paler than the race *bannermani* known from other highland areas in W Africa (Guinea highlands to the west, Jos Plateau and Cameroon highlands to the east).

Red-listed species

Malaconotus lagdeni is Near-Threatened (BirdLife International 2004). *Phyllastrephus baumanni* may soon come out of the Data Deficient category, as it seems locally common and adaptable; in addition to natural forest clearings, it seems at home in secondary rank growth, even where seriously invaded by the exotic *Chromolaena odorata*. Prior to 2004, its known localities in Ghana were Cape Coast (5°7'N, 1°15'W) and Ejura (7°23'N, 1°15'W), and the Shiare area (Moyer 1996, Fishpool 2000). We found it in secondary growth in *Chromolaena* farmbrush south of Atewa Range (c. 6°14'N, 0°34'W), in forest clearings with *Chromolaena* in Bia National Park (6°36'N, 3°3'W), and in thick *Chromolaena* at forest edges in the south of Digya NP (7°8'N, 0°28'W). Thus it is likely to be more widespread in Ghana and W Africa than hitherto supposed (Fishpool 2000). *Tigriornis leucolopha* (Data Deficient) is probably under-recorded and is now known from as many as 11 localities in Ghana (pers. obs.).

Kyabobo as an Important Bird Area

From the significant number of GC species, the presence of several rare species like *Malaconotus lagdeni* and its unique position in the forest-savanna transition zone, the proposed Kyabobo NP deserves to be an Important Bird Area. It is part of an area of E Ghana where the forest is expanding over woodland, as in S Gabon and central Congo, where enclosed savannas are similarly receding (de Foresta 1990, Schwartz *et al.* 1990, Dowsett-Lemaire 1996, White 2001). With time, more forest species could expand into Kyabobo. Forest spread is of concern for the management of large grazing mammals, and the park's advisers have pointed out that late fires may be

necessary to limit it (P. Hartley pers. comm.). Farmers in Kyabobo have deforested part of the Laboum basin, but their impact in the core of the park seems very low. The relocation of the small farming communities was completed in 2006, and the infrastructure for the park is also in place (L. Kanton *in litt.* 2007).

Acknowledgments

We thank the Executive Director of the Wildlife Division, Forestry Commission (Y. Ofori-Frimpong) and the Regional Director of IUCN (I. Thiaw) for inviting us to undertake this survey. Wildlife Division staff at Accra (especially Mike Adu-Nsiah and Kodjo Menka) and the Park Manager and colleagues at Kyabobo are thanked for much logistical support. The IUCN/WDSP Team Leader in Ghana, Peter Howard, was an enthusiastic supervisor, and his colleague in Kyabobo (Peter Hartley) provided much practical help. Luri Kanton, the present manager of Kyabobo, has informed us of the latest developments. R.A. Cheke, J.M. Lock and F. Walsh kindly clarified some records from Fazao in Togo. We thank R.A. Cheke and L.L. Grimes for constructive comments.

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The birds of a montane forest mosaic in Big Babanki area, Bamenda Highlands, Cameroon

by Ondřej Sedláček¹, Jiří Reif¹, David Hořák¹, Jan Riegert², Michal Pešata³ & Petr Klvaňa⁴

¹Department of Ecology, Faculty of Science, Charles University in Prague, Viničná 7, CZ-128 44 Praha, Czech Republic.

<zbrd@email.cz>, <horakd@centrum.cz>, <jirireif@yahoo.com>

²Department of Zoology, Faculty of Biological Sciences, University of South Bohemia, Branišovská 31, CZ-370 05 České Budějovice, Czech Republic. <honza@riegert.cz>

³Department of Ecology, Faculty of Agriculture, University of South Bohemia, Branišovská 31, CZ-370 05 České Budějovice, Czech Republic. <indianl@centrum.cz>

⁴Bird Ringing Centre of the National Museum in Prague, Hornoměřcholupská 34, 102 00 Praha 10 – Hostivař, Czech Republic. <p.klvana@centrum.cz>

Received 17 October 2006; revised 16 May 2007.

Summary

We surveyed a non-protected montane forest mosaic in Bamenda Highlands, Cameroon, in the periods 11 Nov to 17 Dec 2003 and 22 Nov to 7 Dec 2005. We summarise information on abundance, habitat use, vocalisation and breeding activity of 109 bird species. Despite considerable forest fragmentation, species confined to montane forest constituted a substantial part of the bird community, including 12 species endemic to the Cameroon Mountains. However, we did not record several forest specialists such as Bar-tailed Trogon *Apaloderma vittatum* and Cameroon Olive Greenbul *Phyllastrephus poensis*, which are reported as relatively common in the large forest block of Mt Oku, and which appear to be sensitive to forest fragmentation. On the other hand, we recorded Great Blue Turaco *Corythaeola cristata*, which has been considered extinct on Mt Oku due to forest clearing. We recorded one Red Kite *Milvus milvus*, which is the southernmost observation of this Palearctic migrant in Africa and the first for Cameroon. In the beginning of the dry season, the vast majority of recorded bird species sang and we confirmed breeding of many passerines.

Résumé

Les oiseaux d'une forêt de montagne en mosaïque dans la région du Big Babanki, Monts Bamenda, Cameroun. Nous avons étudié une forêt de montagne en mosaïque non protégée dans les Monts Bamenda au Cameroun,

pour les périodes des 11 nov au 17 déc 2003 et 22 nov au 7 déc 2005. Nous résumons les données sur la densité, l'utilisation de l'habitat, les vocalisations et l'activité reproductrice de 109 espèces d'oiseaux. Malgré une fragmentation considérable de la forêt, les espèces liées à la forêt de montagne formaient une part importante de la communauté avienne, y compris 12 espèces endémiques aux monts camerounais. Cependant, nous n'avons pu observer plusieurs spécialistes de la forêt tels que le Trogon à queue barrée *Apaloderma vittatum* et le Bulbul olivâtre *Phyllastrephus poensis*, qui sont considérés comme assez communs dans le grand bloc forestier du Mt Oku, et qui semblent sensibles à la fragmentation de la forêt. En revanche, nous avons observé le Touraco géant *Corythaeola cristata*, considéré comme éteint sur le Mt Oku à cause de la déforestation. Nous avons observé un Milan royal *Milvus milvus*, l'observation la plus méridionale de ce migrateur paléarctique en Afrique et la première pour le Cameroun. Au début de la saison sèche, l'immense majorité des espèces observées chantait et nous avons pu confirmer la reproduction de beaucoup de passereaux.

Introduction

West African forests are considered to be among the most important hotspots of global biodiversity and endemism (Orme *et al.* 2005). Most of them are lowland. The Cameroon Mountains form the only range in W Africa of sufficient height and extent for the development of a specific afromontane community (Tye 1986). Owing to their climatic stability and long-term isolation, the Cameroon Mountains host many unique life forms (Fjeldså & Lovett 1997). The area contains 28 restricted-range bird species making it the third richest endemic bird area in mainland Africa (Stattersfield *et al.* 1998). During the Quaternary, montane forests expanded to lower altitudes during glacials and retreated back to smaller fragments at higher altitudes during periods of climatic optima (Elenga *et al.* 2000). Recently, montane forests are confined to altitudes above 1600 m a.s.l (Thomas 1986).

Besides Mt Cameroon and Mt Kupe, the Bamenda Highlands are the most diverse and important area in the region (Graham *et al.* 2005). Unfortunately, intensive logging has reduced formerly continuous forests to isolated fragments during recent decades (ICBP 1992). Remaining montane forest patches are mostly confined to steep slopes of valleys. The largest one is found on the slopes of Mt Oku and covers about 9000 ha (the Kilum-Ijim forest, Forboseh & Maisels 2000). This forest remnant maintains the largest populations of montane endemic species within the area (Fishpool & Evans 2001) and attracts therefore considerable attention of ornithologists and conservationists (Stuart 1986, Fotso 1996, 2001, Dowsett-Lemaire & Dowsett 1998, Thomas *et al.* 2000, McKay & Coulthard 2000, Forboseh *et al.* 2003, Reif *et al.* 2006, 2007). However, small patches of montane forests are still

scattered throughout the cultivated landscape of the Bamenda Highlands. Our survey was carried out in a non-protected montane forest mosaic southwest of Mt. Oku. The aim of this article is to summarise information on abundance, habitat use, vocalisations and breeding activity of birds recorded in the area.

Study Area and Methods

The study was performed in the area named My Ogade near the villages of Big Babanki and Kedjom-Keku, Bamenda Highlands, North-West Province, Cameroon (6°5'26''N, 10°18'9''E; 2200 m a.s.l.). The area is a part of the Mt Oku massif and is 21 km northeast of Bamenda, 27 km southwest of Mt Oku and 5 km west of Mbi crater (Fig. 1). It covers *c.* 1 km² and comprises a mosaic of montane grasslands, pastures, fields, montane forest and forested corridors along streams. The montane forest was represented by two medium-sized patches (*c.* 20 ha together) and several small fragments (0.1–1 ha). In this area, there is a single wet season from March/April to mid-November (Tye 1986), with annual rainfall on Mt Oku *c.* 2100 mm (Tye 1992).

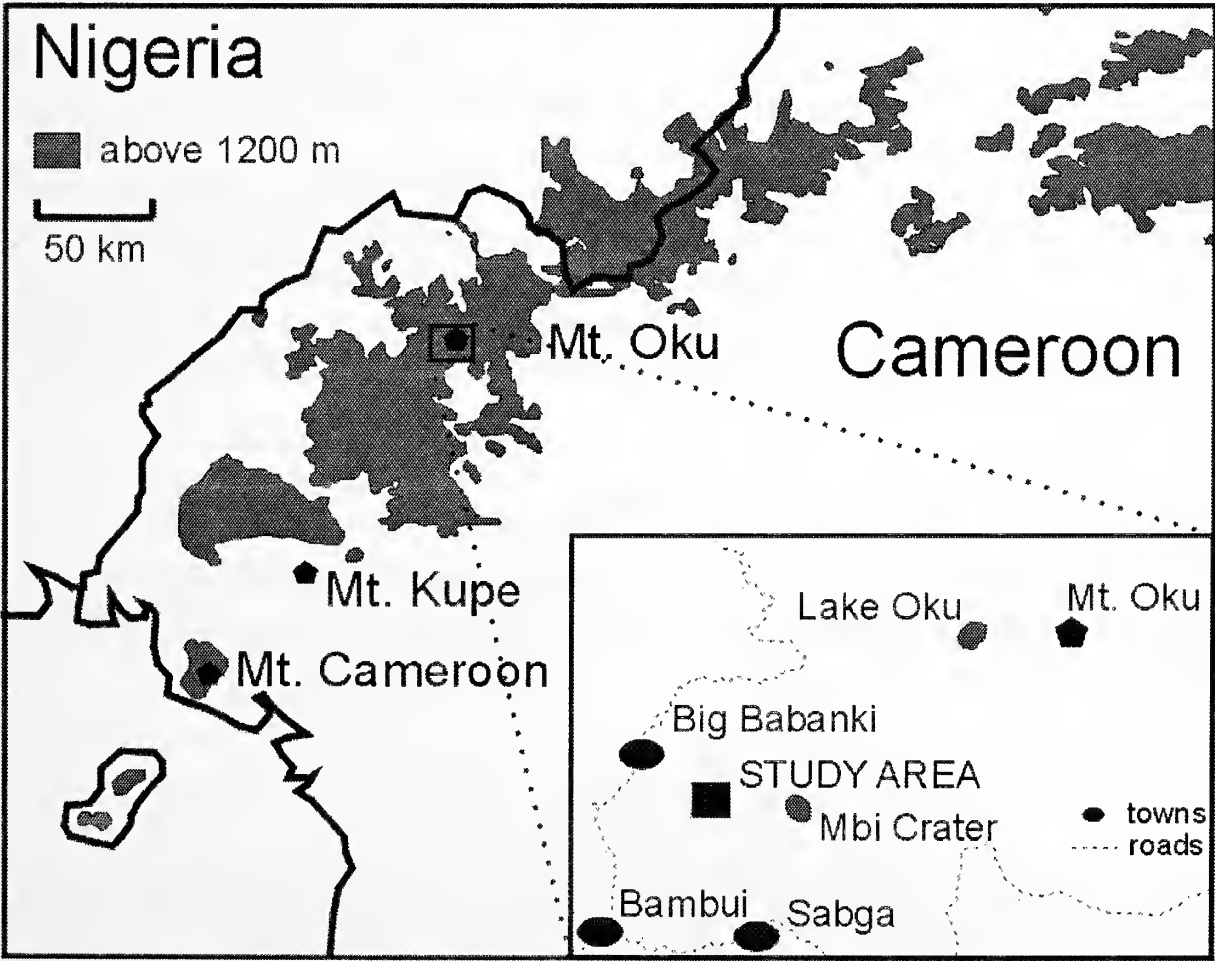


Figure 1. Location of the study area in the Cameroon Mountains.

Observations were made at the beginning of dry season, in the periods 11 Nov to 17 Dec 2003 and 22 Nov to 7 Dec 2005. We camped within the study area and observed birds continuously from dawn to dusk each day. Calls were also recorded after dusk. Relative abundance, habitat use, voice activity and breeding activity of all bird species were recorded.

We use the abundance categories of Stuart & Jensen (1986): + = species observed occasionally within the study area (less than one bird recorded per observer per day); 1 = one bird or a pair recorded per observer per day; 2 = 3–6 birds recorded per observer per day; 3 = 7–15 birds recorded per observer per day; 4 = >15 birds recorded per observer per day; 5 = so abundant that it can be seen or heard constantly. We ascribe habitat use to ten categories: 1 = patches of primary montane forest dominated mainly by *Shefflera abyssinica*, *S. manii*, *Bersama abyssinica*, *Syzygium staudtii*, *Carapa grandiflora* and *Ixora foliosa*; 2 = disturbed patches of montane forest (*e.g.* burned), forest clearings and edges, secondary forest; 3 = shrubby corridors along streams, gallery forest connecting patches of montane forest; 4 = scrubland (*Hypericum lanceolatum* and *Lasiosiphon glaucum* dominate) without tall trees; 5 = mainly *Pteridium aquilinum* fern with solitary shrubs; 6 = intensively grazed pastures dominated by *Sporobolus africanus* and *Pennisetum cladestinum* with sparse shrubs and ferns; 7 = lightly grazed pastures, tall grasslands dominated by *Hyparrhenia* sp.; 8 = rocky grasslands; 9 = rocks, rocky slopes; 10 = birds only passing through the study area. We recognized three categories of voice activity: 0 = no vocalisations; 1 = calls only; 2 = singing males or territorial calls. We recognized four categories of probability of breeding: 0 = no breeding activity (did not hold a territory and did not sing); 1 = possible breeding (a pair repeatedly observed at a site, duet calls or singing male recorded); 2 = probable breeding (alarm calls in the vicinity of a nest, a pair building a nest *etc.*); 3 = confirmed breeding (a nest with eggs or nestlings found). Status is indicated as: R = resident; E = Cameroon Mountains endemic; M = Palearctic migrant. We follow the taxonomic sequence and scientific names of Borrow & Demey (2001).

Results

We recorded 109 species in the study area, including montane forest species, Cameroon Mountains endemics, birds of savanna woodlands and Palearctic migrants (Table 1).

Discussion

Despite considerable reduction of montane forest in the study area, forest species constituted a substantial part of the bird community. However, we did not record the forest specialists Bar-tailed Trogon *Apaloderma vittatum* and Cameroon Olive

Table 1. Residence status (RS), abundance (A), habitats (H), vocal activity (V) and breeding activity (B) of birds in the study area. Species not listed by Fotso (2001) are indicated by an asterisk. See Methods for key.

	RS	A	H	V	B
Scopidae					
<i>Scopus umbretta</i> Hamerkop	R	+	10	0	0
Accipitridae					
<i>Pernis apivorus</i> European Honey Buzzard	M	+	10	0	0
<i>Macheiramphus alcinus</i> Bat Hawk	R	+	10	0	0
* <i>Milvus milvus</i> Red Kite	M	+	10	0	0
<i>M. migrans</i> Black Kite	R	+	10	0	0
<i>Gypohierax angolensis</i> Palm-nut Vulture	R	+	10	0	0
<i>Necrosyrtes monachus</i> Hooded Vulture	R	+	10	0	0
<i>Gyps africanus</i> African White-backed Vulture	R	2–4	10	0	0
<i>Polyboroides typus</i> African Harrier Hawk	R	+	10	0	0
<i>Circus aeruginosus</i> Eurasian Marsh Harrier	M	+,1	5,6,7	0	0
<i>Accipiter melanoleucus</i> Black Sparrowhawk	R	1	1,2	2	1
<i>Buteo auguralis</i> Red-necked Buzzard	R	1–2	2,5,6	2	1
<i>Aquila rapax</i> Tawny Eagle	R	+	10	2	0
<i>A. wahlbergi</i> Wahlberg's Eagle	R	+	10	2	0
<i>Lophaetus occipitalis</i> Long-crested Eagle	R	1	1,2	2	1
Falconidae					
<i>Falco tinnunculus</i> Common Kestrel	R	+,1	4,5,6,7	2	0
<i>F. biarmicus</i> Lanner Falcon	R	+	6,7,8,9	2	0
<i>F. peregrinus</i> Peregrine Falcon	R	+,1	6,7,8,9	2	0
Phasianidae					
<i>Francolinus squamatus</i> Scaly Francolin	R	3	2,3,4,5,6	2	3
Columbidae					
<i>Treron calvus</i> African Green Pigeon	R	+	2	2	0
<i>Turtur tympanistria</i> Tambourine Dove	R	3	1,2,3	2	2
<i>Columba sjostedti</i> Cameroon Olive Pigeon	E	+	1,2	0	0
<i>Streptopelia semitorquata</i> Red-eyed Dove	R	+	4	2	0
Musophagidae					
<i>Corythaeola cristata</i> Great Blue Turaco	R	3	1,2	2	0
<i>Tauraco bannermani</i> Bannerman's Turaco	E	3	1,2	2	1
Cuculidae					
<i>Chrysococcyx klaas</i> Klaas's Cuckoo	R	+,1	2,4	2	1
Caprimulgidae					
* <i>Caprimulgus nigriscapularis</i> Black-shouldered Nightjar	R	2–3	1,2	2	1
<i>C. tristigma</i> Freckled Nightjar	R	1–2	2,9	2	1
Apodidae					
<i>Apus barbatus</i> African Black Swift	R	+,3	9,10	1	0

	RS	A	H	V	B
Coliidae					
<i>Colius striatus</i> Speckled Mousebird	R	3–4	2,3,4,5	2	0
Alcedinidae					
<i>Alcedo leucogaster</i> White-bellied Kingfisher	R	+	2	1	0
Meropidae					
<i>Merops variegatus</i> Blue-breasted Bee-eater	R	+	4,5	1	0
Capitonidae					
<i>Pogoniulus coryphaeus</i> Western Green Tinkerbird	R	3	1,2,3	2	1
<i>P. bilineatus</i> Yellow-rumped Tinkerbird	R	2	1,2,3	2	1
Indicatoridae					
<i>Indicator indicator</i> Greater Honeyguide	R	+	4	0	0
<i>I. minor</i> Lesser Honeyguide	R	+	2,3,4	0	0
* <i>I. exilis</i> Least Honeyguide	R	+	2,3,4	0	0
Picidae					
* <i>Jynx ruficollis</i> Red-throated Wryneck	R	+	2	2	1
<i>Dendropicos fuscescens</i> Cardinal Woodpecker	R	1	2,4	2	1
<i>D. elliotii</i> Elliot's Woodpecker	R	1	2	2	1
<i>D. goertae</i> Grey Woodpecker	R	1–2	2	2	1
Hirundinidae					
<i>Psolidoprocne pristoptera</i> Black Saw-wing	R	+,1–4	10	1	0
<i>Hirundo fuligula</i> Rock Martin	R	2–3	9,10	1	0
<i>H. rustica</i> Barn Swallow	M	+,3	4,5,6,7	0	0
<i>Delichon urbicum</i> Common House Martin	M	+,3	4,5,6,7	0	0
Motacillidae					
<i>Motacilla flava</i> Yellow Wagtail	M	1–2	6	2	0
<i>Anthus cinnamomeus</i> Grassland Pipit	R	1	6,7,8	2	1
<i>A. trivialis</i> Tree Pipit	M	1	4,6	1	0
Campephagidae					
<i>Campephaga petiti</i> Petit's Cuckoo-shrike	R	+	2	0	0
<i>Coracina caesia</i> Grey Cuckoo-shrike	R	+	1,2	0	0
Pycnonotidae					
<i>Andropadus montanus</i> Cameroon Mountane Greenbul	E	3	1,2,3	2	1
<i>A. tephrolaemus</i> Western Mountain Greenbul	E	3	1,2,3	2	1
<i>Pycnonotus barbatus</i> Common Bulbul		3–4	2,3,4,5	2	1
Turdidae					
<i>Cossypha isabellae</i> Mountain Robin Chat	E	1	1,2,3	2	0
<i>C. niveicapilla</i> Snowy-crowned Robin Chat	R	+	1,2,3	0	0
<i>Cercotrichas hartlaubi</i> Brown-backed Scrub Robin	R	+	4,7	2	1
<i>Saxicola torquatus</i> Common Stonechat	R	4	2,3,4,5,6,7	2	2
<i>Oenanthe</i> sp. Wheatear sp.	M	+	6	0	0

	RS	A	H	V	B
<i>Myrmecocichla cinnamomeiventris</i> Cliff Chat	R	+	9	0	1
<i>Turdus pelios</i> African Thrush	R	2	1,2,3,4	1	0
Sylviidae					
<i>Bradypterus bangwaensis</i> Bangwa Forest Warbler	E	3	1,2,3	2	2
<i>Chloropeta natalensis</i> African Yellow Warbler	R	3	1,2,3	2	2
<i>Cisticola chubbi</i> Chubb's Cisticola	R	5	2,3,4,5,7	2	3
<i>C. brunescens</i> Pectoral-patch Cisticola	R	2-3	6	2	3
<i>Prinia subflava</i> Tawny-flanked Prinia	R	1	7	2	1
<i>Urolais epichlora</i> Green Longtail	E	+	1	1	0
<i>Apalis pulchra</i> Black-collared Apalis	R	3	1,2,3	2	2
<i>A. jacksoni</i> Black-throated Apalis	R	+,1	2,4	2	2
<i>A. cinerea</i> Grey Apalis	R	3	1,2,3	2	1
<i>Phylloscopus trochilus</i> Willow Warbler	M	3	2,3,4,5	2	0
<i>P. sibilatrix</i> Wood Warbler	M	+	4	0	0
<i>Sylvia borin</i> Garden Warbler	M	+	2,3,4	0	0
Muscicapidae					
<i>Muscicapa adusta</i> African Dusky Flycatcher	R	1-2	1,2,3,4	2	3
<i>Ficedula hypoleuca</i> Pied Flycatcher	M	+	2,3,4	0	0
Monarchidae					
<i>Elminia longicauda</i> African Blue Flycatcher	R	+	3	0	0
<i>E. albiventris</i> White-bellied Crested Flycatcher	R	+,1-2	1,2	2	3
Platysteiridae					
<i>Platysteira laticincta</i> Banded Wattle-eye	E	+	1,2,3	0	0
<i>Batis minor</i> Black-headed Batis	R	+,1-2	2,4	2	1
Timaliidae					
<i>Pseudoalcippe abyssinica</i> African Hill Babbler	R	3	1,2,3	2	3
Paridae					
<i>Parus albiventris</i> White-bellied Tit	R	1-2	2,3,4	2	1
Nectariniidae					
<i>Cyanomitra oritis</i> Cameroon Sunbird	E	2-3	1,2,3	1	0
<i>Cinnyris reichenowi</i> Northern Double-collared Sunbird	R	5	1,2,3,4,5,6	2	3
<i>C. bouvieri</i> Orange-tufted Sunbird	R	3-4	2,3,4,5,6	2	3
<i>C. coccinigaster</i> Splendid Sunbird	R	+	3	0	0
Zosteropidae					
<i>Zosterops senegalensis</i> Yellow White-eye	R	3	2,3,4,5	2	3
Laniidae					
<i>Lanius collaris</i> Common Fiscal	R	+	5,6	0	0
<i>L. mackinnoni</i> Mackinnon's Shrike	R	1	4,5	2	1
Malaconotidae					
* <i>Tchagra australis</i> Brown-crowned Tchagra	R	+,1	4,5,6	2	1

	RS	A	H	V	B
<i>Laniarius atroflavus</i> Yellow-breasted Boubou	E	4–5	1,2,3,4,5	2	3
Oriolidae					
<i>Oriolus nigripennis</i> Black-winged Oriole	R	1–2	1,2	2	1
Corvidae					
<i>Corvus albus</i> Pied Crow	R	1–3	6,10	1	0
Sturnidae					
<i>Onychognathus walleri</i> Waller's Starling	R	+	2,4	0	0
Ploceidae					
<i>Ploceus baglafecht</i> Baglafecht Weaver	R	2	2,3,4,5	2	1
<i>P. bannermani</i> Bannerman's Weaver	E	3	2,3,4	2	3
<i>P. melanogaster</i> Black-billed Weaver	R	1	1,2	0	0
<i>P. insignis</i> Brown-capped Weaver	R	+,1	1,2	2	1
<i>Euplectes capensis</i> Yellow Bishop	R	4	4,5,6	2	3
<i>E. ardens</i> Red-collared Widowbird	R	2	7	2	1
Estrildidae					
<i>Nesocharis shelleyi</i> Little Oliveback	E	1	2,3	0	2
<i>Cryptospiza reichenowi</i> Red-faced Crimsonwing	R	1–3	1,2,3	2	1
* <i>Euschistospiza dybowski</i> Dybowski's Twinspot	R	1–2	2,3,4	0	0
* <i>Lagonosticta rubricata</i> Blue-billed Firefinch	R	1–2	3,4,5,6	2	1
<i>Spermestes bicolor</i> Black-and-white Mannikin	R	1	4,7	0	0
<i>Estrilda astrild</i> Common Waxbill	R	4	4,5,6,7	2	2
<i>E. nonnula</i> Black-crowned Waxbill	R	4	4,5,6,7	2	3
Viduidae					
* <i>Vidua macroura</i> Pin-tailed Whydah	R	+,1	4,5,6,7	2	1
Fringillidae					
<i>Serinus mozambicus</i> Yellow-fronted Canary	R	2	3,4,5,6	2	3
<i>S. burtoni</i> Thick-billed Seedeater	R	4	2,3,4,5,6	2	3
<i>Linurgus olivaceus</i> Oriole Finch	R	4	1,2,3,4,5,6	2	3
Emberizidae					
* <i>Emberiza tahapisi</i> Cinnamon-breasted Rock Bunting	R	3–4	6,8	2	2

Greenbul *Phyllastreus poensis*, which were reported by Fotso (2001) as common in the large forest block of Mt Oku. Other forest species, *e.g.* Green Longtail, were much less abundant than in Kilum-Ijim forest on Mt Oku (Forboseh *et al.* 2003). We suppose that these species could be more sensitive to forest area reduction and that small fragments of disturbed forest are not able to maintain viable populations of them (see Newsome 1986, Newmark 1991). Green-breasted Bush-Shrike *Malaconotus gladiator*, which has been reported by Stuart & Jensen (1986) from Mt Oku, was not recently recorded by Fotso (2001) and we did not record it either. Thus, it seems to have disappeared from this part of the Bamenda Highlands.

On the other hand, we recorded Great Blue Turaco, which was reported by Fotso (2001) as extinct in the area due to forest clearing. During both our stays, groups of 2–10 individuals were seen and heard each morning and evening, moving between forest patches. This species is relatively common in the area, at least in the beginning of dry season.

We recorded (OS and DH) one specimen of Red Kite gliding over the area on 12 Nov 2003 at *c.* 100 m above the ground. We observed it from below under very good conditions for *c.* 3 min. and recorded characters typical for this species: proportionally longer wings and tail, more contrasting coloration and more deeply forked tail than Black Kite, which is common in the area. We are also familiar with both kite species from central Europe, so we consider the confusion very unlikely. This is the southernmost observation of this species in Africa, the first for Cameroon and the sixth for the whole of sub-Saharan Africa (see Borrow & Demey 2001). Some individuals may thus rarely overwinter in tropical W Africa.

In the beginning of dry season, most bird species sang and we confirmed breeding of many passerines. In general, our observations confirm the results of Fotso (1996), who concluded that most of the species which nest during the dry season are insectivorous, while the omnivores and frugivores (*i.e.* turacos, pigeons, mousebirds, greenbul, thrushes) breed during the early wet season. However, we confirmed an earlier start of the breeding season for some bird species as compared to the findings of Fotso (1996), *i.e.* Scaly Francolin, White-bellied Crested Flycatcher, African Hill Babbler, Bannerman's Weaver and Oriole Finch. On the other hand, we are convinced that Cameroon Sunbird did not breed during our study periods, confirming the findings of Fotso (1996) who reported breeding of this sunbird only in April and June, *i.e.* during the rainy season. We recorded several juveniles of Cameroon Sunbird during November, which suggests that the breeding season of this species ends at the end of the wet season, *i.e.* during October.

We assembled quite a few breeding records of endemic and montane species in small forest patches (White-bellied Crested Flycatcher, African Hill Babbler, Black-collared Apalis, African Dusky Flycatcher) and shrubs or isolated trees outside the forest (Bannerman's Weaver, Oriole Finch, Yellow-breasted Boubou, Thick-billed Seedeater and Northern Double-collared Sunbird). However, many tropical species are long-lived and thus can survive for a relatively long time in small forest patches without sufficient reproductive success to ensure population maintenance, or they may immigrate from larger patches (Brooks *et al.* 1999, Marsden 2006). Typically, insectivore diversity and abundance decrease significantly following disturbance (Waltert *et al.* 2005, Grey *et al.* 2006) and forest specialists suffer from an increased proportion of forest edge in a fragmented landscape (Dale *et al.* 1999). However, we suggest that although the remaining small forest fragments and shrubby corridors along the streams possibly do not permit forest interior species to maintain viable populations in our study area, they still could be important for their role in promoting movement between larger patches. They may also act as breeding habitat for montane species less sensitive to forest area reduction.

The study area suffers from grazing and extensive wood cutting and farming. But the most damaging human activity is the setting of bush fires during the dry season. Burning not only prevents the slow process of forest regeneration, but kills the trees and changes the vegetation structure and microclimatic conditions at forest edges, which dry up and become more sensitive to fires during the next dry season. Not only the montane biota but also thousands of people, who are dependent on water from the mountains, are negatively affected by continuing rapid desiccation of the environment through deforestation.

Acknowledgments

We thank Štěpán Janeček, Záběj Hrázský, Václav Gvoždík, Dáša Bystřická, Michael Bartoš and Jakub Brom who helped us in the field. We are grateful to the Cameroon Biodiversity Conservation Society and the Bamenda Highlands and Kilum-Ijim Forest Projects, especially to Dr. Michael Boboh Vabi, for enabling us to perform the research in the Bamenda Highlands. The study was performed with the kind permission of Ndawara-Belo ranch. We thank the entire Kedjom-Keku community, particularly the Fon of Big Babanki and Ernest Vunan and Devine Chikelem from the SATEC NGO, for their kind reception. We also thank Ron Demey and an anonymous referee for providing useful criticisms of the manuscript. The research is supported by Grant Agency of the Czech Republic (206/03/H034) and Ministry of Education (0021620828, 6007665801, LC 06073). Our study of birds in Bamenda Highlands is funded by the Grant Agency of the Czech Academy of Sciences (IAA601410709, KJB601110703).

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Bird population densities along two precipitation gradients in Senegal and Niger

by Bo Svenning Petersen, Kim Diget Christensen & Flemming Pagh Jensen

Orbicon, Ringstedvej 20, DK-4000 Roskilde, Denmark <bo@orbicon.dk>

Received 12 October 2006; revised 8 March 2007

Summary

Wet season densities of terrestrial birds were estimated along two 300–350 km long N–S precipitation gradients using distance sampling methods. The habitat was farmland that graded into grassland or thornbush savanna towards the north. Species richness was generally higher in Senegal than in Niger, probably due to a higher density of trees. Estimated mean densities (all species combined) varied between 475 and 862 birds per km². The most numerous species were Sudan Golden Sparrow *Passer luteus* in the northern parts of both areas, Village Weaver *Ploceus cucullatus* in S and central Senegal, and Northern Grey-headed Sparrow *Passer griseus* in S Niger. Densities of most species varied in response to precipitation differences, with very few species being evenly distributed along the gradients. In Niger, post-breeding northward displacements of large, grasshopper-eating species (Abdim's Stork *Ciconia abdimii*, Cattle Egret *Bubulcus ibis* and Yellow-billed Kite *Milvus migrans parasiticus*) were detected. Some previously under-recorded lark species were found in good numbers in Niger, where Kordofan Lark *Mirafra cordofanica* and Dunn's Lark *Eremalauda dunni* locally occurred at up to 6 and 7.9 birds per 10 ha, respectively. In Senegal, the highest densities of Savile's Bustard *Eupodotis savilei* (up to ten calling males per km²) were found south of 14°N. Large vultures, including Lappet-faced Vulture *Torgos tracheliotus* and White-headed Vulture *Trigonoceps occipitalis*, were recorded at mean densities of 0.51–0.58 per km² in W Senegal but were not found in the study area in Niger.

Résumé

Densités de population d'oiseaux sur deux gradients de précipitations au Sénégal et au Niger. Les densités d'oiseaux terrestres en saison des pluies ont été estimées sur deux gradients N–S de précipitations de 300–350 km de long à l'aide de méthodes d'échantillonnage à distance. L'habitat consistait en terre agricole qui passait en savane herbacée ou épineuse en allant vers le nord. La

richesse spécifique était généralement plus grande au Sénégal qu'au Niger, probablement due à une plus grande densité d'arbres. Les densités moyennes estimées (toutes espèces confondues) variaient de 475 à 862 oiseaux au km². L'espèce la plus abondante était le Moineau doré *Passer luteus* au nord de ces deux zones, le Tisserin gendarme *Ploceus cucullatus* au sud et au centre du Sénégal et le Moineau gris *Passer griseus* au sud Niger. La densité de la plupart des espèces variait selon les différences de précipitations tandis que quelques rares espèces étaient également distribuées le long de ces gradients. Au Niger, des mouvements vers le nord après la reproduction d'espèces acridophages (Cigogne d'Abdim *Ciconia abdimii*, Héron garde-boeuf *Bubulcus ibis* et Milan noir *Milvus migrans parasitus*) ont été notés. Quelques espèces d'alouettes, jusqu'à présent sous-estimées, ont été trouvées en nombre appréciable au Niger, où l'Alouette du Kordofan *Mirafraca cordofanica* et l'Alouette de Dunn *Eremalauta dunnii* se rencontraient localement et respectivement à raison de 6 et 7,9 oiseaux pour 10 ha. Au Sénégal, les plus fortes densités d'Outarde houpette *Eupodotis savilei* (jusqu'à 10 mâles appelant au km²) ont été trouvées au sud du 14°N. Les grands vautours, y compris le Vautour oricou *Torgos tracheliotus* et le Vautour à tête blanche *Trigonoceps occipitalis*, ont été notés à la densité de 0,51–0,58 au km² dans l'Ouest du Sénégal mais n'ont pas été trouvés dans la zone d'étude au Niger.

Introduction

In 2003 and 2004, wet season counts of terrestrial birds were carried out in W Senegal and S-central Niger. The work was part of the Préliss project (*Projet Régional de Lutte Intégrée contre les Sauteriaux au Sahel*), and the aim was to provide information on population densities of grasshopper-eating birds along two precipitation gradients, each of them 300–350 km long and stretching from the northern part of the Sudan zone into the Sahel. Although the project focused on birds preying on grasshoppers, all species were recorded.

The avifauna of Senegal is fairly well described (Morel & Morel 1990, Sauvage & Rodwell 1998), and bird population densities have been the subject of several studies in the northernmost parts of the country. Monthly counts of resident and migratory birds were carried out at Keur Mor Ibra, SE of Richard Toll, in 1960–2 (Morel 1968) and at Fété Olé 60 km further east in 1969–82 (Morel & Morel 1980 and unpubl.). Close to the former area, Keith & Mullié (1990) performed weekly bird counts in Jul–Oct 1989 as part of a study of impacts of chemical locust and grasshopper control. Densities of Palaearctic migrants have been recorded in the Ferlo Avifaunal Reserves (Ornis Consult 1997) and have also been the subject of a study in SW Mauritania (Browne 1982).

In Niger, little ornithological work has apparently been done outside the SW corner of the country and, to a lesser extent, the Air Mountains. The late P. Souvairan performed transect counts year-round in Makalondi district in 1991–3, but the results were never published (J. Brouwer *in litt.*, P. Giraudoux *in litt.*). According to the available information (Giraudoux *et al.* 1988, Holyoak & Seddon 1991a,b, Sauvage 1993, Debout *et al.* 2000, J. Brouwer *in litt.*) large parts of our study areas had not been visited by ornithologists since the 1930s, at least not during the rainy season. Densities of Palaearctic passerines have been studied in the Sahel zone of N Nigeria (*e.g.* Jones *et al.* 1996), but data on bird densities and distribution during the rainy season do not seem to exist from this part of W Africa.

The present paper presents an overview of the bird census results. No comprehensive analysis of bird population densities in relation to land use, vegetation structure or previous findings is attempted. However, all census sites were georeferenced, and the full data set is freely available for further scientific analysis (see Methods).

Although our focus was on densities of common birds, five species new to Niger were recorded during the project (Christensen *et al.* 2005, 2006). Also, a number of range extensions and species recorded only a few times in Niger were found. Some of these findings are briefly described. We also include our records and density estimates of vultures and eagles, because dramatic population declines of these species have recently been reported from Mali, Burkina Faso and Niger (Rondeau & Thiollay 2004, Thiollay 2006).

Methods

Census areas

Fig. 1 shows the location of the sites where censuses were performed. The sites were spaced along two precipitation gradients, ranging from 800 to 300 mm per year in Senegal and from 600 to 200–250 mm in Niger. In Senegal, the natural vegetation along most of this gradient is Sudanian wooded savanna and grasslands that pass into Sahelian grassland and thornbush savanna towards the north. In Niger, Sudanian open woodlands are only found south of the 500 mm isohyet, whereas the major part of the gradient lies within the Sahelian zone. Along both gradients the vegetation is heavily modified by human cultivation. The census areas generally consisted of farmland, or mixed grassland and farmland, with scattered villages. The dominant crop is millet (Niger) or millet and groundnuts (Senegal). In the south, small patches of woodland remain, particularly in Senegal, while pastoral grasslands become progressively more frequent towards the north, especially in Niger. A major difference between the two countries is the generally much higher density of trees at the Senegal sites, even within the Sahelian zone, although extensive logging has also occurred here.

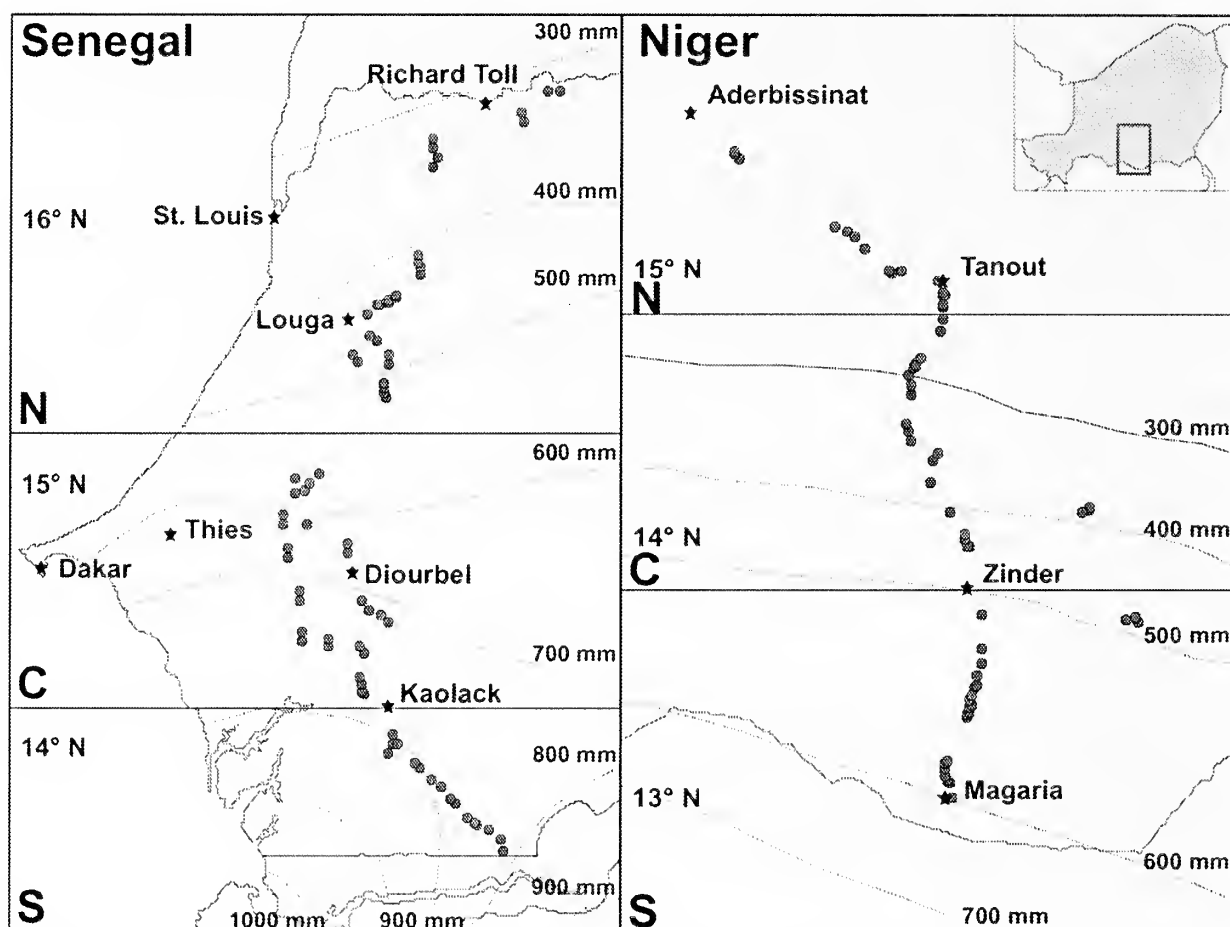


Figure 1. Map of the census areas in Senegal and Niger. Dots show where censuses were performed. Isohyets and the regions used in the data analysis are indicated (N = north, C = central, S = south).

For estimation of mean bird densities, each precipitation gradient was divided into three regions with approximately the same number of censuses (except Senegal S) and the boundaries between regions more or less corresponding to visible changes in land cover/use (cf. above). The Senegal C and Niger S regions were roughly comparable as were Senegal N and Niger C. The Senegal S region, with many large trees, did not compare with anything found along the Niger gradient. Likewise, an area corresponding to the dry, open Niger N did not occur along the Senegal gradient.

Bird counts

Bird counts were performed in 2003 and 2004, between 7 June and 20 September, corresponding to the period of main rainfall. In Senegal, 133 transects were carried out between 30 Jul and 20 Aug 2003, and 143 between 14 Jul and 4 Aug 2004 (total 276). In Niger, there were 80 transects during the period 11–21 Jul 2003, 49 during 14–20 Sep 2003, 128 during 7–24 Jun 2004 and 74 during 29 Aug to 8 Sep 2004 (total 331). Each day, two observers performed censuses independently of each other at different sites. All counts started immediately after sunrise and lasted for 4 h,

except when curtailed because of rain or, in a few cases, excessive heat. The censuses were carried out as line transects, and each morning count session consisted of four line transects of 50 min. duration. End points (start and stop) of all transects were recorded using GPS. The intended walking speed was 1.2 km.h^{-1} , and the average transect length was 1058 m. After finishing each transect, the observer walked briskly along for 8–10 minutes to make successive transects independent of each other.

The starting point for the first transect each morning was randomly selected (as number of km to be driven) along a road traversing the region to be censused. If this point happened to be inside a town or village, the starting point was displaced to c. 500 m after the town/village. In order to avoid looking against the sun, the direction of walking as a rule was due west. If this line was blocked by wetlands, villages etc. the observer displaced the line as appropriate to avoid the obstacle, while still recording the birds.

All birds seen or heard perched or on the ground at either side of the line were recorded and assigned to one of seven distance bands (0–25 m, 25–50 m, 50–75 m, 75–100 m, 100–200 m, 200–300 m, 300–400 m). Birds seen or heard more than 400 m off the line were not recorded, as were birds only seen flying, with the exception of birds in song-flight that were assigned to the distance band where they were first discovered. Only birds that could be identified to species were noted. Unidentified sounds were described, assigned to a distance band and later identified to species (if possible) using Chappuis (2000).

These counts were supplemented with snapshot counts of flying raptors (Bibby *et al.* 2000). Snapshot counts were performed at the beginning and in the middle of each transect, and each lasted 1 min.. During the snapshots flying raptors were recorded 400 m to each side and 500 m ahead of the observer so that the two snapshot counts together covered approximately the same area as the line-transect counts.

In addition to the censuses performed along the two gradients (Fig. 1), a number of counts (24 and 30 line transects, respectively) were carried out in Niger in the areas of Tahoua ($14^{\circ}55'N$, $5^{\circ}15'E$) and Diffa ($13^{\circ}20'N$, $12^{\circ}35'E$) in 2003. Because these counts were performed by the same observers, using the same methods and in a similar landscape as the main counts, they were included in the estimation of species-specific detection probabilities (see below).

Eight different observers took part in the censuses. All of them had previous experience with systematic bird census work and a good knowledge of African birds. To standardize the methodology, harmonize estimation of distances etc., two observers worked together on the first one or two days of each counting period.

Data analysis

Based on the field counts, density estimates were calculated for each bird species. For each of the 37 most abundant species (all species with > 200 records or > 400 recorded individuals), absolute densities were estimated with Distance 4.1 software (Thomas *et al.* 2003) fitting a species-specific detection function model to the distribution of records across distance bands. The probability of detection was

assumed not to differ significantly between regions, so for each species a common detection function was fitted to data from all regions, including the counts from the Tahoua and Diffa areas. Choice of model was performed following the recommendations of Buckland *et al.* (1993) and was mainly based upon a low value of Akaike's Information Criterion and a good visual fit to the distribution of records. In most species a hazard-rate model fitted the data well, but in a few species a half-normal model or a uniform model with cosine series expansion provided a better fit. The computed Effective Strip Width (ESW, the distance where the number of birds overlooked inside the strip equals the number recorded outside the strip) varied between 35 m (*Ploceus luteolus*: see Appendix for English names not mentioned in the text) and 400 m (*Eupodotis savilei* advertisement call) for these 37 species.

For the less numerous species, detection function models were not fitted in Distance and field count data were converted to absolute densities using an estimated ESW. For each of these 195 species, the choice of ESW was based upon similarity to one or more of the 37 abundant species with respect to the distribution of records across distance bands or, in species with few records, similarity in visibility and/or vocal behaviour. The estimated ESWs varied between 25 m (species with almost all records inside the innermost band, *e.g.* Quail-plover *Ortyxelos meiffrenii*, Pearl-spotted Owlet *Glaucidium perlatum*, silent warblers, *Petronia dentata*) and 300 m (species with almost equal distribution of records across distance bands, *e.g.* large raptors).

Densities of flying raptors at each line transect were calculated by dividing the total number of each species seen on the two snapshot counts by the area covered by these counts ($2 \times 0.4 \text{ km}^2$). Raptor density data from line transect counts and snapshot counts were combined by using, for each line transect, the maximum of the two density estimates (in most cases the estimate from the line transect count).

Depending on the species, the number of birds recorded may represent the number of territories or advertising males (*e.g.* *Eupodotis savilei*, singing warblers) or the number of individuals present (*e.g.* *Bubulcus ibis*, *Lamprolornis* starlings) or may fall somewhere in between these two extremes. Given the uncertainties involved, we did not attempt to adjust for these differences.

Taxonomy and nomenclature follow Borrow & Demey (2001).

Data availability

A summarized version of the original data set has been placed on the W.A.O.S. web site at <http://malimbus.free.fr/suppindex.htm>. This data set gives the coordinates of all 607 transects and the number of individuals of each bird species recorded on each, plus the computed or estimated ESWs for all 232 species. More detailed data or density estimates are available for further scientific analysis upon request to the authors.

Sources of bias

The study was designed with the purpose of estimating average densities of common birds during the rainy season in representative areas of farmland and grassland in W

Senegal and S-central Niger. For obvious reasons villages and towns were avoided by the observers as were areas more than 5 km from easily drivable roads. This led to an under-representation of species associated with human settlements (*e.g.* Common Bulbul *Pycnonotus barbatus*) or with very remote areas (*e.g.* bustards Otididae). Apart from these constraints, the random selection of starting points and fixed direction of walking probably ensured representative sampling of the different habitats and their associated avifauna.

One of the main assumptions of distance sampling is that all individuals within the innermost band are recorded. Violation of this assumption leads to an underestimation of density. This may occur if birds flee from the observer before detection or if birds are overlooked or cannot be identified. Evasive movements may, if frequent, be detected by inspection of the distribution of records across distance bands (Buckland *et al.* 1993). Only one of the 37 species analysed in Distance (*Eupodotis savilei*) showed clear signs of evasive movements, which in this case was handled by merging all records in the four innermost bands (0–100 m).

The probability of overlooking a bird depends, apart from its size and coloration, on its behaviour, which varies during the breeding cycle. Thus, densities of skulking and nocturnal species and of some dry season breeders not showing advertising behaviour during the census period were probably underestimated. During the counts the observer must proceed as steadily as possible, deviations from the line must be kept to a minimum, and it is generally not allowed to approach a bird for identification. Even if all observers were fairly skilled, the latter constraint almost certainly caused an under-recording of species such as Yellow-bellied Eremomela *Eremomela icteropygialis* and Northern Crombec *Sylvietta brachyura* (which have very similar songs), some weavers *etc.* Because birds not identified to species were not recorded, total densities are surely underestimated.

Along some parts of the transects, especially in the southern parts of the census areas, the observer's view was restricted by woody vegetation or by high-grown millet plants. This certainly violated the assumption of equal probability of detection across sites, but data from such areas were too sparse to allow separate modelling of the detection functions. As a consequence, densities in Niger S and (especially) Senegal S are probably underestimated.

Bias in distance estimation may also affect the estimation of densities, but control measuring of distances estimated by the observers revealed no obvious biases. If anything, distances were probably overestimated, leading to an underestimation of densities.

Overestimation of densities may result if individual birds are recorded more than once. This is the main reason for proceeding steadily along the line, keeping track of individuals of common species and not diverting too much effort into species identification. All observers had a thorough understanding of the rationale of the method and previous experience with systematic counts of terrestrial birds, so it is believed that bias due to double counting was negligible.

Results

The total number of species and the mean densities (birds per km²) in each of the six regions are shown in Table 1. A total of 232 species was recorded on the transects, but many of them too infrequently to allow a reasonable estimation of densities. The Appendix gives densities of all species with more than ten records that fulfil one of the following criteria: (1) mean density > 1 per km² in either Senegal or Niger; (2) density > 2 per km² in at least one of the six regions. To give an impression of the variation, local densities of two species with different distribution patterns are shown in Fig. 2.

Table 1. Summary data on the line transects carried out in each country and region.

	Senegal				Niger			
	Total	S	C	N	Total	S	C	N
No. of line transects	276	62	103	111	331	115	115	101
No. of species recorded	170	112	109	104	168	122	97	87
Mean bird density per km ²	663	475	670	762	639	477	862	566
Mean density excluding <i>Passer luteus</i>	565	475	666	528	470	473	500	430

A comparison of counts performed early and late in the rainy season in Niger revealed significant differences in densities of species such as *Bubulcus ibis* and *Milvus migrans parasiticus* (Table 2). The latter species occurred in fairly high numbers north of Zinder (14°–14°25'N) in July and further north (around 14°55'N) in September. Also *Ciconia abdimii* occurred in high densities in the northern part of the Niger study area in September but not in Jun–Jul. On 19 Sep 2003, the following mean densities were recorded along four 1 km transects a few km south of Tanout: *Ciconia abdimii* 384, *Bubulcus ibis* 164 and *Milvus m. parasiticus* 94 per km². Grasshopper densities along these transects were high (average 7 per m²) but not exceptional.

Table 2. Estimated mean densities (no./km²) of Cattle Egret *Bubulcus ibis* and Yellow-billed Kite *Milvus migrans parasiticus* in the Niger study areas Jun–Sep.

	<i>Bubulcus ibis</i>			<i>Milvus m. parasiticus</i>		
	S	C	N	S	C	N
June	61.5	10.0	3.4	0.4	0	0
July	30.2	0.5	5.0	0.7	11.0	2.5
August–September	0	0	34.9	0	0.2	12.4

In addition to the common lark species, some rare or uncommon larks were recorded on the transects. In some areas, one or more of these species were even

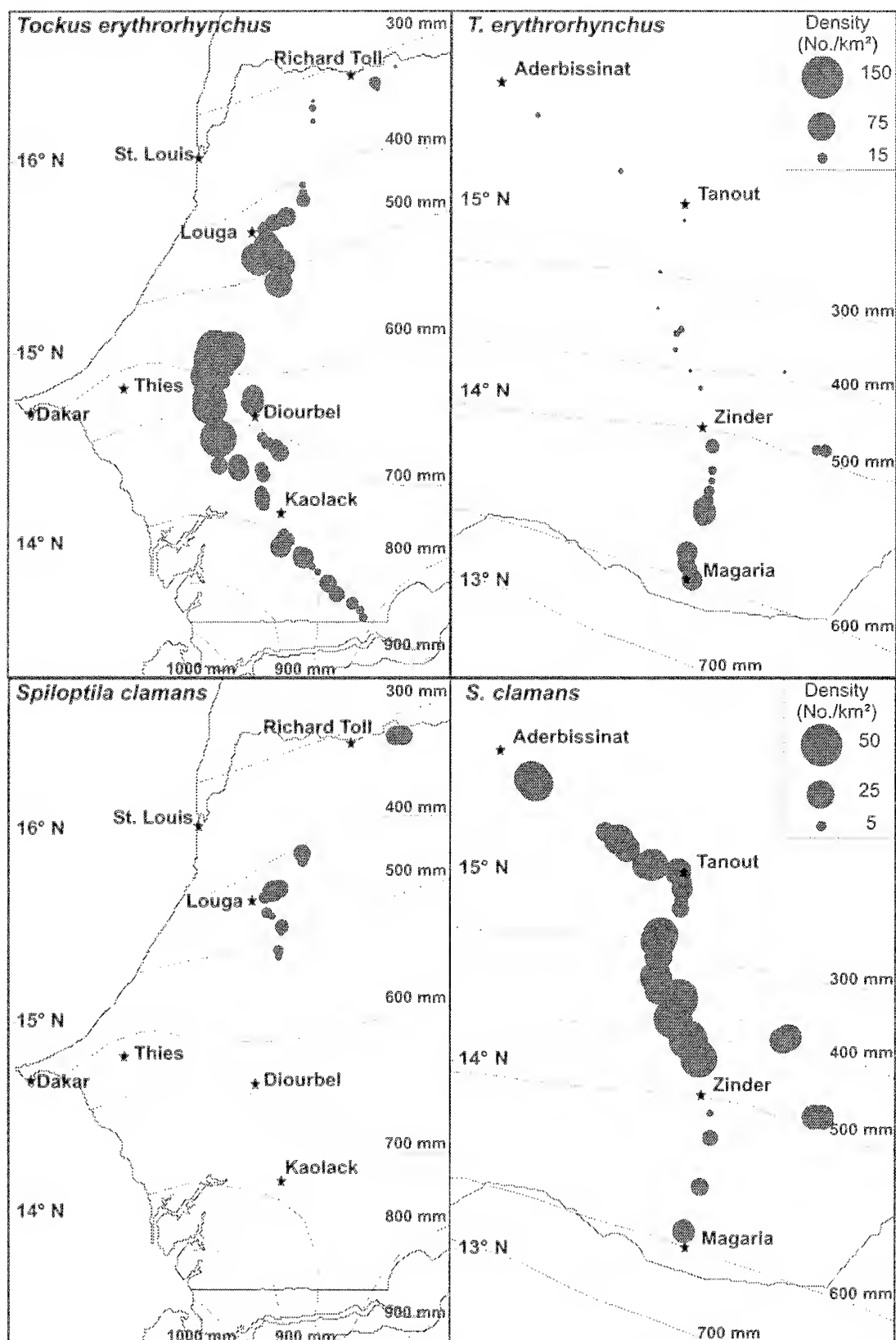


Figure 2. Estimated densities of Red-billed Hornbill *Tockus erythrorhynchus* and Cricket Warbler *Spiloptila clamans* along the precipitation gradients in Senegal and Niger. Dot area indicates estimated density (the key does not show all possible dot sizes). Each dot represents one morning count (mean of four 1-km transects). Apparent gaps in distribution may reflect lack of censuses, cf. Fig. 1.

sufficiently frequent to allow a tentative estimation of densities. Because good views are generally needed for identification, most of these lark species have narrow ESWs (30–65 m), sometimes resulting in fairly high density figures if expressed per km², as generally used in this paper. This may be misleading if a species is only locally common, so the densities below are reported as number per 10 ha (which also keeps the density figures well below the actual number of individuals recorded).

***Mirafra cordofanica* Kordofan Lark** (58 records). Niger: common between Zinder and Tanout (13°58'–14°47'N), 16–19 Jul 2003, with mean density 1.1 per 10 ha and maximum density 6 per 10 ha; not seen further north; less common 16–20 Sep 2003 in the same area (mean 0.2, max. 2.2 per 10 ha); also recorded NE of Tahoua (15°5'N, 5°37'E) 25 Jul 2003 (0–4 per 10 ha); much rarer in 2004, single birds recorded 12 and 13 Jun in the same belt between Zinder and Tanout as in 2003. Senegal: no records in 2003; one record of a single bird NE of Louga (15°41'N, 16°7'W) 30 Jul 2004.

***M. rufocinnamomea* Flappet Lark** (79 records). Only recorded in Senegal between 14°N and the Gambian border. Mean densities in this area 0.4 per 10 ha (30 Jul to 2 Aug 2003) and 0.6 per 10 ha (14–18 Jul 2004), max. densities 2.3 and 3.4 per 10 ha in 2003 and 2004, respectively.

***M. rufa* Rusty Bush-lark**. Three records from Niger, north and east of Zinder, in 2004: one (14°6'N, 9°24'E) 11 Jun; one (14°19'N, 8°48'E) 12 Jun; four (13°41'N, 9°34'E) 19 Jun.

***Pinarocorys erythropygia* Rufous-rumped Lark**. Three records from Niger in 2003: one S of Tanout (14°47'N 8°50'E) 20 Sep; two single individuals near Diffa (13°18'N, 12°33'E) 23 Sep.

***Ammodramus deserti* Desert Lark** (9 records, 16 individuals). Only recorded in Niger. Southernmost record 33 km S of Tanout (14°41'N, 8°46'E), density 0.4 per 10 ha, 18 Sep 2003. More numerous, albeit patchy, only 35–40 km further north; mean density 6 per 10 ha, 25 km WNW of Tanout, 8 Sep 2004.

***Eremalauda dunni* Dunn's Lark** (41 records, 66 individuals). Only recorded in Niger. Frequent along the road between Zinder and Aderbissinat from 14°7'N northwards, mean densities: 0.17 per 10 ha, 17–21 Jul 2003; 0.9 per 10 ha, 11–24 Jun 2004; 0.4 per 10 ha, 3–8 Sep 2004. Maximum densities were found in the northernmost part of this area: 7.9 and 6.6 per 10 ha at 15°27'N, 8°4'E, 16 and 24 Jun 2004, respectively. Also recorded NE of Tahoua: two at 15°17'N, 5°56'E, 23 Jul 2003; one at 15°4'N, 5°36'E, 25 Jul 2003; four SW of Diffa (13°17'N, 12°31'E), 23 Sep 2003.

All four species of large vulture breeding in W Africa were recorded in Senegal between 14°14' and 15°51'N, but none was seen on Senegal S or any transect in Niger. Estimated densities (no./km²) are: African White-backed Vulture *Gyps africanus* Senegal C 0.27, Senegal N 0.09; Rüppel's Griffon *G. rueppellii* Senegal C 0.24, Senegal N 0.37; Lappet-faced Vulture *Torgos tracheliotus* Senegal N 0.12, found only in a narrow belt around Louga (15°30'–15°42'N). White-headed Vulture *Trigonoceps occipitalis* was recorded just once, 10 km NNW of Diourbel (10 Aug

2003). Hooded Vulture *Necrosyrtes monachus* was recorded in mean densities of 0.15 per km² in Senegal and 0.04 per km² in Niger, but due to its association with towns and villages these mean densities almost certainly underestimate the true density. Egyptian Vulture *Neophron percnopterus* was seen once, in Niger, 35 km S of Tanout, 13 Jun 2004.

Three species of savanna or woodland eagles were recorded in Senegal. Tawny Eagle *Aquila rapax* was seen twice, 25 km SSE of Kaolack and 30 km E of Richard Toll, respectively. A single African Hawk Eagle *Hieraaetus spilogaster* was seen 10 km ENE of Louga (15°40'N, 16°10'W, the first record in this atlas square), 30 Jul 2004, and a Martial Eagle *Polemaetus bellicosus* was seen 30 km SSE of Louga, 20 Aug 2003. None of these species was found in the Niger census areas, where the only eagle recorded was a Wahlberg's Eagle *Aquila wahlbergi* half-way between Magaria and Zinder (13 Jun 2003).

Discussion

Species richness was generally higher in Senegal than in Niger, probably due to the higher structural diversity of the vegetation. The low number of transects in Senegal S (about half the number conducted elsewhere, cf. Table 1) probably explains the comparatively few species recorded in that region, which otherwise would be expected to hold the highest number of species. Given that densities in the southern regions are almost certainly underestimated (cf. Sources of bias, above), total densities were fairly constant across regions if the flocks and colonies of *Passer luteus* are excluded.

The gradient of decreasing precipitation from south to north is the major factor affecting the distribution of species in this part of Africa. Table 3 shows our interpretation of the distribution of 67 species along this gradient during the rainy season, based upon the density estimates given in the Appendix. The following example illustrates how species were placed along the gradient: *Streptopelia vinacea* occurred at its highest densities in Senegal C and Niger S and was therefore placed in the Senegal C–Niger S group, whereas *S. senegalensis* was most numerous in Senegal N and Niger S and was therefore placed in an intermediate position between Senegal C–Niger S and Senegal N–Niger C. Only ten of the species included in the Appendix could not reasonably be placed along this gradient. Some of these were mainly associated with locally occurring habitats (e.g. *Bubulcus ibis*, *Ploceus melanocephalus*) and very few species, if any, were almost equally distributed across the area.

The north-south distribution patterns revealed here are generally well known, and only a few findings deserve further discussion. *Eupodotis savilei* was only recorded in Senegal, where it occurred all along the precipitation gradient. We found it to be clearly more numerous in the Sudanian zone than in the Sahel, reaching its highest

Table 3. Location of the highest densities of 67 species in Jun–Sep along the N–S gradient. Data from Senegal and Niger have been combined. The precipitation ranges are rough indications of the annual rainfall in each region. Each species was placed in one of the seven groups according to the region(s) where it was most numerous (see text); three of the groups take up intermediate positions between the regions/precipitation ranges defined. See Appendix for English names.

Niger N	
<300 mm	<i>Eremalauda dunni</i> , <i>Oenanthe (bottae) heuglini</i> , <i>Turdoides fulvus</i>
Intermediate	<i>Burhinus capensis</i> , <i>Cursorius temminckii</i> , <i>Pterocles exustus</i> , <i>Streptopelia roseogrisea</i> , <i>Urocolius macrourus</i> , <i>Merops albicollis</i> , <i>Upupa epops</i> , <i>Galerida cristata</i> , <i>Eremopterix leucotis</i> , <i>E. nigriceps</i> , <i>Cercotrichas podobe</i> , <i>Amadina fasciata</i>
Senegal N/ Niger C	<i>Vanellus tectus</i> , <i>Oena capensis</i> , <i>Mirafraga cantillans</i> , <i>M. cordofanica</i> , <i>Cercotrichas galactotes</i> , <i>Cisticola aridulus</i> , <i>Spiloptila clamans</i> , <i>Lanius meridionalis</i> , <i>L. senator</i> , <i>Lamprotornis pulcher</i> , <i>Passer luteus</i> , <i>Quelea quelea</i>
300–500 mm	
Intermediate	<i>Streptopelia senegalensis</i> , <i>Halcyon chelicuti</i> , <i>Bubalornis albirostris</i> , <i>Sporopipes frontalis</i> , <i>Ploceus velatus</i> , <i>Lonchura cantans</i>
Senegal C/ Niger S	<i>Streptopelia vinacea</i> , <i>Psittacula krameri</i> , <i>Halcyon senegalensis</i> , <i>Coracias abyssinicus</i> , <i>Phoeniculus purpureus</i> , <i>Tockus erythrorhynchus</i> , <i>Lybius vielloti</i> , <i>Chalcomitra senegalensis</i> , <i>Cinnyris pulchellus</i> , <i>Ptilostomus afer</i> , <i>Lamprotornis chalybaeus</i> , <i>Passer griseus</i> , <i>Ploceus luteolus</i> , <i>Uraeginthus bengalus</i> , <i>Serinus leucopygius</i>
500–750 mm	
Intermediate	<i>Eupodotis savilei</i> , <i>Turtur abyssinicus</i> , <i>Streptopelia decipiens</i> , <i>Centropus senegalensis</i> , <i>Merops pusillus</i> , <i>Tockus nasutus</i> , <i>Cisticola juncidis</i> , <i>Prinia subflava</i> , <i>Camaroptera brachyura</i> , <i>Tchagra senegala</i> , <i>Lamprotornis caudatus</i> , <i>Petronia dentata</i> , <i>Ploceus cucullatus</i> , <i>Euplectes franciscanus</i> , <i>Lagonosticta senegala</i>
Senegal S >750 mm	<i>Francolinus bicalcaratus</i> , <i>Mirafraga rufocinnamomea</i> , <i>Laniarius barbarus</i> , <i>Lamprotornis chloropterus</i>

densities (up to ten calling males per km²) between the Gambian border and 14°N. The species was classified as restricted to the Sahel biome by Fishpool & Evans (2001), and Sauvage & Rodwell (1998) described it as frequent between 14° and 16°N, but apparently not further south. It may recently have expanded southwards, and good numbers could possibly also occur south of the Gambian border where it was first discovered in 1994 (Borrow 1997, Payne *et al.* 1997). The other Sahelian biome-restricted species (*sensu* Fishpool & Evans) all occurred most frequently in the northern part of the study areas.

The high densities of *Bubulcus ibis*, *Ciconia abdimii* and *Milvus m. parasiticus* recorded in September in Niger N, coinciding with the virtual disappearance of these

species from the southern parts of the study area, indicate that significant northward movements occur towards the end of the breeding season. These post-breeding movements are most probably an adaptation to utilization of the seasonal abundance of grasshoppers, especially *Oedaleus senegalensis*, in the northern grasslands.

In addition to the north-south differences, several differences between Senegal and Niger are apparent (cf. Appendix). Many of these are related to the higher density of trees found in Senegal, even in the drier parts of the country. Common arboreal species such as *Urocolius macrourus*, *Halcyon senegalensis*, *H. chelicuti*, *Coracias abyssinicus*, *Tockus erythrorhynchus*, *Lybius vieilloti*, *Lamprotornis* starlings (except *L. pulcher*), *Bubalornis albirostris* and *Ploceus* weavers (except *P. luteolus*) all occurred in higher numbers in Senegal than in Niger. On the other hand, many species associated with open, dry country, with or without scattered bushes, were more frequent in Niger than in areas receiving a similar amount of rainfall in Senegal (e.g. *Oena capensis*, *Eremopterix leucotis*, *E. nigriceps*, *Cercotrichas galactotes*, *Cisticola aridulus*, *Spiloptila clamans*, *Lanius meridionalis* and *Sporopipes frontalis*). A few exceptions from this general trend are mentioned in the following.

Despite their arboreal habits, all sunbird species were more numerous in Niger than in Senegal. This was the case even in *Chalcomitra senegalensis*, which was recorded at a mean density of 6.4 per km² between the Nigerian border and Zinder, and Copper Sunbird *Cinnyris cupreus*, of which we had three records (north to 13°22'N). There have been less than ten previous records of *Chalcomitra senegalensis* in Niger, and our records of *Cinnyris cupreus* are the first ones outside "W" National Park (Giraudaux *et al.* 1988, J. Brouwer *in litt.*). All four sunbird species recorded are rains migrants at the northern limit of their range, so their occurrence varies from year to year and from place to place, depending on the northward extension of the rains and on local differences in rainfall.

Among the dry country species, the three common waders *Burhinus capensis*, *Cursorius temminckii* and *Vanellus tectus* were more frequent in Senegal than in Niger. A possible reason for this could be the higher incidence of bush fires in Senegal, creating suitable habitat. Also *Mirafraga cantillans* occurred in higher densities in northern Senegal than in most similar areas in Niger. However, mean densities of 40 per km², comparable to those in Senegal N, were recorded at the additional counts in the Tahoua area in Niger. Generally, the regional mean densities shown in the Appendix may conceal large local variations (cf. Fig. 2), especially in colonial species and species whose optimum habitat is patchily distributed. For instance, whereas the mean density of *M. cantillans* in Senegal N was 44 per km², maximum densities regularly recorded along 1-km transects were as high as 200–250 per km². The latter figure compares well with the 22–37 singing males per 10 ha found by Mullié & Keith (1991).

Our records of *Mirafraga cordofanica* and *M. rufa* from Niger are the first records since 1931 (Giraudoux *et al.* 1988, J. Brouwer *in litt.*). At least in some years, *M. cordofanica* seems to be fairly common in a belt between Zinder and Tanout, but the

paucity of records in 2004 may indicate a rather erratic occurrence. *Eremalauda dunni* (less than ten previous records from Niger) proved surprisingly common too, mainly north of the *M. cordofanica* belt. Also *Ammomanes deserti* was found in fairly high densities south of the area where it had previously been recorded (*i.e.* north of 15°18'N, cf. Giraudoux *et al.* 1988). The novelty of these findings from Niger may simply reflect that very little ornithological work has been done during the rainy season in the areas in question, but the records may also represent southward range extensions (cf. the recent discovery of Golden Nightjar *Caprimulgus eximius* in Cameroon (Sinclair *et al.* 2003)). In Senegal, our record of *M. cordofanica* seems to be the first south of 16°N (Morel & Morel 1990, Sauvage & Rodwell 1998). *M. rufocinnamomea* proved unexpectedly common in Senegal S, but all our records (except one west of 16°W) fall within the known range of the species.

No large vultures and eagles were recorded on the transects in Niger. In Senegal, large vultures were absent from the southern and northernmost parts of our study area but were elsewhere found in fair numbers. *Gyps rueppellii* and *G. africanus* were most frequent, but also *Torgos tracheliotus* was regularly seen on the transects and a few large eagles were recorded as well. According to W. Mullié (*in litt.*), flocks of 100 vultures, or rarely up to 600, are regularly seen on carcasses along the main road between Thies and Louga (with typically 40–50% *G. rueppellii*, 35–45% *G. africanus*, 10–15% *Necrosyrtes monachus* and 0–5% *T. tracheliotus*) whereas vultures are now very rare in the northernmost part of Senegal and also in Mauritania.

W African raptor populations have plummeted during recent decades. In Mali, Burkina Faso and Niger, numbers of large vultures and eagles outside protected areas have been reduced by 98% and 86–93%, respectively, since 1969–73 (Thiollay 2006). Our lack of records from Niger fits well into this picture. By contrast, fair numbers of large raptors still seem to survive in Senegal, at least in the W part of the country. Raptor populations have undoubtedly also declined here, and poisoning is known to occur (W. Mullié *in litt.*), but, for unknown reasons, the decline has apparently been less dramatic than in countries further east.

Acknowledgments

The staff of Centre Régional AGRHYMET, Niamey, especially Zakaria Ouambama, and the staff of the Direction de la Protection des Végétaux, Dakar, especially Mbargou Lô and Abdoulaye Niassy, provided invaluable assistance in relation to our field work. All of them are cordially thanked. We also thank Morten M. Hansen, Erik M. Jacobsen, Jørn L. Larsen, Marcel C. Rahner and Anders P. Tøttrup, who performed the censuses together with the authors, and Steffen U. Madsen, who prepared Figs. 1 and 2. Joost Brouwer, Wim C. Mullié and Ulf Ottosson kindly commented on a previous draft of the manuscript, and the comments of the referees, P. Giraudoux and Peter Jones, further improved the paper. The Préliiss project was

funded by DANIDA, Danish Ministry of Foreign Affairs, who also kindly consented to making the data freely available to the scientific community.

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Appendix.

Densities (no./km²) of the 77 species fulfilling the abundance criteria for inclusion (see text). Estimated mean densities are given for Senegal and Niger as well as for each of the six regions.

	Senegal				Niger			
	Mean	S	C	N	Mean	S	C	N
Ardeidae								
<i>Bubulcus ibis</i> Cattle Egret	10.6	14.5	6.9	11.6	17.7	28.9	9.7	14.2
Ciconiidae								
<i>Ciconia abdimii</i> Abdim's Stork					5.7	0.8	0.5	17.2
Accipitridae								
<i>Milvus migrans parasiticus</i> Yellow-billed Kite	0.1	0.1	0.1		2.9	0.3	3.2	5.4
Phasianidae								
<i>Francolinus bicalcaratus</i> Double-spurred Francolin	1.3	4.7	0.2	0.2				
Otididae								
<i>Eupodotis savilei</i> Savile's Bustard	1.2	2.4	0.8	0.7				
Burhinidae								
<i>Burhinus capensis</i> Spotted Thick-knee	1.1		0.2	2.6	0.7			2.2
Glareolidae								
<i>Cursorius temminckii</i> Temminck's Courser	1.3	0.7	0.3	2.4	0.2		0.2	0.4
Charadriidae								
<i>Vanellus tectus</i> Black-headed Lapwing	13.8	15.6	7.9	17.9	1.8	1.7	2.8	0.8
Pteroclididae								
<i>Pterocles exustus</i> Chestnut-bellied Sandgrouse	4.1			10.0	0.4	0.2		1.0
Columbidae								
<i>Turtur abyssinicus</i> Black-billed Wood Dove	1.3	4.4	0.8		0.4	1.1		
<i>Oena capensis</i> Namaqua Dove	4.7		1.2	10.3	9.5	3.7	19.4	4.8
<i>Columba guinea</i> Speckled Pigeon	1.6	2.1	1.1	1.9	0.2	0.3	0.2	0.1

	Senegal				Niger			
	Mean	S	C	N	Mean	S	C	N
<i>Streptopelia decipiens</i> African Mourning Dove	0.7	2.0	0.2	0.3	0.1	0.3		
<i>S. vinacea</i> Vinaceous Dove	7.4	6.3	14.2	2.2	6.4	18.1	0.2	0.1
<i>S. roseogrisea</i> African Collared Dove	3.4		0.6	7.6	2.0	1.4	2.1	2.4
<i>S. senegalensis</i> Laughing Dove	34.8	5.2	31.8	53.9	7.9	16.7	5.2	0.8
Psittacidae								
<i>Psittacula krameri</i> Rose-ringed Parakeet	1.3	1.7	1.7	0.7	2.7	7.8		0.1
Cuculidae								
<i>Chrysococcyx caprius</i> Didric Cuckoo	1.7	1.1	1.7	2.1				
<i>Centropus senegalensis</i> Senegal Coucal	2.0	6.7	0.7	0.5	1.6	4.7		
Coliidae								
<i>Urocolius macrourus</i> Blue-naped Mousebird	2.5		2.2	4.1	0.3		0.3	0.6
Alcedinidae								
<i>Halcyon senegalensis</i> Woodland Kingfisher	4.4	4.8	9.2	0.2	0.1	0.2		
<i>H. helicuti</i> Striped Kingfisher	2.4	0.2	1.7	4.1	0.2	0.4	0.1	
Meropidae								
<i>Merops pusillus</i> Little Bee-eater	1.1	1.8	0.8	1.0	0.3	0.8		
<i>M. albicollis</i> White-throated Bee-eater	1.1			2.7	9.7	0.6	9.9	19.8
<i>M. orientalis</i> Little Green Bee-eater	1.1	3.7	0.6	0.1	0.2			0.6
Coraciidae								
<i>Coracias abyssinicus</i> Abyssinian Roller	16.9	10.9	19.0	18.4	7.5	16.7	3.6	1.6
Phoeniculidae								
<i>Phoeniculus purpureus</i> Green Wood-hoopoe	1.0	0.5	2.3	0.3	1.3	3.2	0.3	0.2
Upupidae								
<i>Upupa epops</i> Hoopoe	1.1		1.3	1.6	0.4	0.3	0.3	0.6
Bucerotidae								
<i>Tockus erythrorhynchus</i> Red-billed Hornbill	35.0	17.7	56.4	26.3	7.4	20.0	0.9	0.4

<i>T. nasutus</i> African Grey Hornbill	4.1	12.2	2.4	1.2	7.8	21.3	1.1	0.2
Capitonidae								
<i>Lybius vieilloti</i> Vieillot's Barbet	1.6	0.4	3.3	0.9	0.3	0.7	0.2	
Alaudidae								
<i>Mirafra cantillans</i> Singing Bush-lark	24.5		17.6	44.1	10.9	1.0	16.4	16.0
<i>M. cordofanica</i> Kordofan Lark	0.0			0.1	1.1		3.1	
<i>M. rufocinnamomea</i> Flappet Lark	1.1	4.7						
<i>Eremalauda dunni</i> Dunn's Lark					2.8		3.0	5.8
<i>Galerida cristata</i> Crested Lark	1.1		1.0	1.8	0.9	0.1	1.2	1.4
<i>Eremopterix leucotis</i> Chestnut-backed Sparrow Lark	6.1			14.6	44.2	3.1	55.4	78.4
<i>E. nigriceps</i> Black-crowned Sparrow Lark	7.3			17.7	53.1		46.1	122.0
Turdidae								
<i>Cercotrichas galactotes</i> Rufous Scrub Robin	0.1	0.2		0.2	1.5	0.5	2.6	1.2
<i>C. podobe</i> Black Scrub Robin	0.9		0.3	2.0	1.0		1.4	1.7
<i>Oenanthe (bottae) heuglini</i> Heuglin's Wheatear					1.1		0.5	3.2
Sylviidae								
<i>Cisticola juncidis</i> Zitting Cisticola	7.0	20.1	5.7	0.9	1.1	1.6	0.9	0.7
<i>C. aridulus</i> Desert Cisticola	1.1	0.2	1.1	1.5	8.9	4.4	16.5	5.4
<i>Prinia subflava</i> Tawny-flanked Prinia	14.5	24.2	23.0	1.9	0.6	1.7		
<i>Spiloptila clamans</i> Cricket Warbler	1.6			3.8	14.7	3.5	22.9	18.1
<i>Camaroptera brachyura</i> Grey-backed Camaroptera	2.2	5.8	1.8	0.5	0.1	0.3		
Timaliidae								
<i>Turdoides fulvus</i> Fulvous Babbler					1.3		1.3	2.9
Nectariniidae								
<i>Chalcomitra senegalensis</i> Scarlet-chested Sunbird	0.6	0.8	0.9	0.1	2.3	6.4	0.1	
<i>Hedypna platyura</i> Pygmy Sunbird	0.1	0.2	0.2		4.6	11.0	0.7	1.8
<i>Cinnyris pulchellus</i> Beautiful Sunbird	0.8	0.3	1.1	0.8	2.3	6.0	0.3	0.5

	Senegal				Niger			
	Mean	S	C	N	Mean	S	C	N
Laniidae								
<i>Lanius meridionalis</i> Southern Grey Shrike	2.2			5.4	10.3	3.1	17.7	10.0
<i>L. senator</i> Woodchat Shrike	1.8		0.2	4.1	2.0	0.4	3.1	2.6
Malaconotidae								
<i>Tchagra senegala</i> Black-crowned Tchagra	1.2	1.9	0.3	1.6	0.8	2.2	0.1	
<i>Laniarius barbarus</i> Yellow-crowned Gonolek	0.5	2.3						
Corvidae								
<i>Corvus albus</i> Pied Crow	0.8		2.4		1.6	1.0	0.2	3.6
<i>Ptilostomus afer</i> Piapiac	1.9	2.2	3.8		2.6	7.5		
Sturnidae								
<i>Lamprotornis chalybaeus</i> Greater Blue-eared Starling	9.8	4.5	15.6	7.7	2.4	3.8	1.5	1.7
<i>L. chloropterus</i> Lesser Blue-eared Starling	3.1	7.8	3.7					
<i>L. caudatus</i> Long-tailed Glossy Starling	6.2	13.2	8.7		1.3	3.8		
<i>L. pulcher</i> Chestnut-bellied Starling	20.7	0.9	26.0	27.2	20.3	11.1	38.6	9.7
Passeridae								
<i>Passer griseus</i> Northern Grey-headed Sparrow	29.0	10.4	69.6	4.7	32.6	64.1	24.7	5.7
<i>P. luteus</i> Sudan Golden Sparrow	98.0		3.8	233.7	168.9	3.5	361.8	135.9
<i>Petronia dentata</i> Bush Petronia	0.8	3.5			1.3	3.8		
Ploceidae								
<i>Bubalornis albirostris</i> White-billed Buffalo Weaver	82.0	21.1	73.9	123.1	8.0	13.1	5.3	5.3
<i>Sporopipes frontalis</i> Speckle-fronted Weaver	2.0		5.7		32.2	43.9	46.4	2.5
<i>Ploceus luteolus</i> Little Weaver	5.2	3.6	10.9	1.4	7.7	18.0	3.8	0.4
<i>P. velatus</i> African Masked Weaver	18.0	9.2	17.8	23.2	7.1	10.2	10.0	0.2
<i>P. cucullatus</i> Village Weaver	73.6	130.4	115.9	5.4	0.8	1.8	0.5	
<i>P. melanocephalus</i> Black-headed Weaver	2.0			4.9				
<i>Quelea quelea</i> Red-billed Quelea	1.3		0.3	2.9	37.4	17.0	70.1	22.9

<i>Euplectes franciscanus</i>	Northern Red Bishop	17.7	40.2	22.5	1.1	2.5	6.6	0.5	
Estrildidae									
<i>Lagonosticta senegala</i>	Red-billed Firefinch	0.2	0.8			1.1	2.3	0.6	0.3
<i>Uraeginthus bengalus</i>	Red-cheeked Cordon-bleu	9.5	8.4	21.0	0.3	1.6	4.0	0.6	
<i>Lonchura cantans</i>	African Silverbill	15.4	0.8	16.8	22.3	18.7	28.4	22.2	3.8
<i>Amadina fasciata</i>	Cut-throat	2.6		2.2	4.4	7.4	3.4	9.4	9.7
Fringillidae									
<i>Serinus leucopygius</i>	White-rumped Seedeater	2.6	0.5	6.6	0.4	2.3	5.2	1.4	
Emberizidae									
<i>Emberiza tahapisi</i>	Cinnamon-breasted Rock Bunting					2.8	2.9	2.4	3.3

Short Notes — Notes Courtes

European Griffon Vulture *Gyps fulvus* at Yankari National Park, Nigeria

In March 2005, we made a four-day visit to the Yankari National Park, in Bauchi State, E Nigeria. The Park comprises a large area of mainly dry Guinea savanna, with patches of riparian forest along watercourses. The visitor centre at Wikki Hot Springs is on a ridge, from which there is an excellent view overlooking the savanna forest that borders parts of the river. From c. 10h00 to 14h00, on 6–9 Mar we watched soaring raptors from the bar veranda. The list of soaring birds that we observed from this site included Abdim's stork *Ciconia abdimii*, Black stork *C. nigra*, Palm-nut Vulture *Gypohierax angolensis*, River Eagle *Haliaeetus vocifer*, African Harrier-Hawk *Polyboroides typus*, Bateleur *Terathopius ecaudatus*, Yellow-billed Kite *Milvus (migrans) parasitus*, Brown Snake-Eagle *Circaetus cinereus*, Short-toed Snake-Eagle *C. gallicus*, Grasshopper Buzzard *Butastur rufipennis*, Lizard Buzzard *Kaupifalco monogrammicus*, Dark Chanting Goshawk *Melierax metabates*, Gabar Goshawk *Micronisus gabar*, Shikra *Accipiter badius*, Wahlberg's Eagle *Aquila wahlbergi*, African Hawk-Eagle *Hieraaetus spilogaster*, Martial Eagle *Polemaetus bellicosus*, Lanner *Falco biarmicus*, and Fox Kestrel *F. alopex*.

On each day, just before noon, a few vultures took off from their roosts in the forest, into the forming thermals. We observed five species: Hooded Vulture *Necrosyrtes monachus*, White-backed Vulture *Gyps africanus* (most common of the vultures, with up to 15 birds), European Griffon Vulture *G. fulvus*, White-headed Vulture *Trigonoceps occipitalis*, and Lappet-faced Vulture *Torgos tracheliotus*.

The observations of European Griffon appear to be the first from this area (Brown *et al.* 1982, Hoyo *et al.* 1994, Borrow & Demey 2004). They were seen on all four days with up to three birds observed simultaneously. Two of them were in their third or older plumage, while one with markedly darker underwing coverts probably was in its second plumage (Forsman 1999). They were easily told apart from the similar Rüppell's Griffon Vulture *Gyps rueppellii* by their larger size and different wing-shape (based on experience of both species elsewhere), as well as the contrast between sandy brown coverts (not as dark brown as in *G. rueppellii*) and dark remiges. Furthermore, the whitish area on the median underwing coverts was diagnostic on the two older birds, which excludes Rüppell's Griffon.

The observations of European Griffon Vultures this far southeast in W Africa represent a large extension of the presumed winter range of this species. It remains to be established whether our observations represent vagrants, or if the species is regular in the region.

This is contribution no. 28 from the A.P. Leventis Ornithological Research Institute.

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Received 13 January 2007

Roine Strandberg¹, Ulf Ottosson², Jonas Waldenström¹ & Olof Hellgren¹

¹Department of Animal Ecology, Lund University, SE-22362 Lund, Sweden.

<Roine.Strandberg@zoookol.lu.se>

²A.P. Leventis Ornithological Research Institute,

P.O. Box 13404, Jos, Plateau State, Nigeria.

Bird observations in Mali

During a visit to Mali in 2006, we spent 30 Nov to 7 Dec in the Niger delta, and visited the rice fields at Niono 9–14 Dec. We made, according to Fry *et al.* (1988), Urban *et al.* (1997) and Borrow & Demey (2004), observations that may provide range extensions for some bird species. Furthermore, we found high numbers of one European winter visitor and one intra-African migrant north of Niono.

***Chelictinia riocourii* Swallow-tailed Kite.** During the visit to Niono, we found a Swallow-tailed Kite roost in a small group of eucalyptus trees close to the town at 14°16'N, 6°0'W. During the morning of 11 Dec we counted 3690 kites flying off from the roost at 7h45–9h30. When we left the site there were still about 150 perched in the trees. During mornings when we arrived earlier, more than 500 birds left the roost before 7h30. We estimate that the roost comprised up to 4500 Swallow-tailed Kites. Approximately one third of the kites started the mornings by gathering in nearby acacia trees to the north of the roost in open fields. Here they preened and perched in the sun until about 9h00. The roost at Niono is probably the largest in Mali and was already encountered in Jan 2006, when 2480 birds were counted (J.J. Guitard & P.A. Reynaud, pers. comm.). The Swallow-tailed Kite has declined in parts of W Africa as a result of locust control during the 1980s (Ferguson-Lees & Christie 2001), and the roost at Niono is certainly important during the non-breeding period. Local citizens told us that the birds are seen in the area in big numbers annually, from Oct until spring (during which month the kites leave the area was not clear).

***Asio capensis* Marsh Owl.** In the area known as *Office de Niger* at Niono we visited the rice fields north of the town. Two pairs of Marsh Owls were seen at 14°31'N, 5°56'W during the evenings 11–12 Dec. One pair was displaying over a grassy area close to rice fields, while the other was seen hunting over cultivated fields close to a Marsh Harrier *Circus aeruginosus* roost including 63 birds. These observations extend the known range c. 80 km westward from the Niger delta (Borrow & Demey 2004).

***Streptopelia turtur* Turtle Dove.** In the same area where the Marsh Owls were observed, a large influx of Turtle Doves occurred in the evening, with c. 8000 birds flew south to roost, probably in a tree plantation at 14°31'N, 5°57'W.

***Prinia fluviatilis* River Prinia.** In the central parts of the Niger delta between 15°13'N, 4°19'W and 14°55'N, 4°20'W, we noted 12 singing River Prinias along the riverbanks, 4–5 Dec. We had seen the species at Djoudj, Senegal, the previous month. We had good views of three of the birds in the Niger delta and they had considerable paler plumage than Tawny-flanked Prinias *P. subflava* seen during this trip and previously. The song was “smoother” than Tawny-flanked Prinia and matched perfectly sound recordings of the River Prinia (Chappuis 2000). The River Prinia has never been reported from the delta before (Borrow & Demey 2004), having most probably been overlooked.

***Acrocephalus rufescens* Greater Swamp Warbler.** Close to Niono, at 14°16'N, 6°00'W in high broad-leaved grass resembling a *Phragmites* sp., we saw one Greater Swamp Warbler and heard one singing, close to the Swallow-tailed Kite roost, 12 Dec. According to Borrow & Demey (2004) there are only doubtful records from Mali. We heard the song well for at least 2 min. in the morning and close by we observed a rather dark brown, long-billed, heavy *Acrocephalus* with a long rounded tail and all-dark legs, a prominent supercilium and a grey wash on the underparts, diagnostic of this species. The area north of Niono is probably very good for the species and a quite recent colonization could have occurred in association with increased areas of abandoned rice cultivations.

***Phylloscopus ibericus* Iberian Chiffchaff.** In a flooded area south of Lac Débo, Niger delta, at 15°16'N, 4°10'W, with plenty of bushes standing in water, we observed three Iberian Chiffchaffs and heard at least two more calling, 2–3 Dec. Song, calls and yellowish undertail-coverts all matched this species. We saw none matching Common Chiffchaffs *P. collybita* during our visit. The Iberian Chiffchaff has not been reported previously from the northern part of the Niger delta, but is only recently accepted as a full species (Sangster *et al.* 2002), which might explain why it has been overlooked.

Thanks to Olivier Girard for valuable and constructive comments on the manuscript.

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Received 15 February 2007

Revised 20 April 2007

Roine Strandberg¹ & Patrik Olofsson²

¹Department of Animal Ecology, Lund University, SE-22362 Lund, Sweden.

<roine.strandberg@zooekol.lu.se>

²Furubodavägen 73, SE-29692 Yngsjö, Sweden.

No confirmed record of Black-backed Cisticola *Cisticola eximius* from Benin

During a visit to the Pendjari National Park, Benin, small cisticolas with heavily streaked black heads and backs contrasting strongly with the bright orange-rufous necks and rumps were observed (Salewski & Korb 2007). These birds were identified in the field, with the aid of Borrow & Demey (2004), as being Black-backed Cisticolas *Cisticola eximius*. Three species of cisticola were mistnetted at the site or in its vicinity. Besides Croaking Cisticola *C. natalensis* and Short-winged Cisticola *C. brachyptera*, a small cisticola was captured c. 200 m from the location where the presumed Black-backed Cisticolas were seen. A photograph of this bird was published as Fig. 1 in Salewski & Korb (2007) to prove the first record of Black-backed Cisticola in Benin. On later consideration I concluded, however, that the bird on the photograph was Zitting Cisticola *C. juncidis*. Unlike Black-backed Cisticola the bird on the photograph is not very rufous, but rather brownish on the back and head (Borrow & Demey 2001). It also has a faint blackish subterminal band on the brownish tail (Borrow & Demey 2004). The latter character was more obvious on another photograph of the same bird where the tail was visible from below. As the bird figured in Salewski & Korb (2007) is definitely not Black-backed Cisticola the occurrence of this species in Benin is not yet confirmed and must be deleted from the country's list. However, with respect to the above-mentioned observation of birds tentatively identified in the field as Black-backed Cisticola, a more thorough investigation may reveal the occurrence of this species in the Park.

I stress that the inclusion of Fig.1 in Salewski & Korb (2007) is entirely due to my own inattention and not caused by errors of Judith Korb, my co-author.

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Received 1 August 2007

Revised 18 September 2007

Volker Salewski

Prinz-Rupprecht-Str. 34, 93053 Regensburg, Germany. <salewski.volker@web.de>

Grey-necked Picathartes *Picathartes oreas* use man-made structures to breed

The Grey-necked Picathartes *Picathartes oreas* is well known for its specific nesting requirement: a tall, slightly overhanging rock face, which does not allow rain to fall into the nest (Thompson & Fotso 1995). For example, all nests recorded on Mt Cameroon were on overhanging rock faces (Tye 1987). Nests are constructed either on an isolated rock usually not far from a forest stream, or inside a cave. In addition the rock face has to be high enough to allow the birds to construct the nest at least 2 m from the ground (Fry *et al.* 2000). The only published exceptions are a nest found on the trunk of a tree in Cameroon (Waltert & Mühlenberg 2000) and one in a hollow, cave-like log (Fry *et al.* 2000).

Here we describe two *P. oreas* nest sites under concrete bridges in Lopé National Park, Gabon. The bridges at both sites provide exactly what is required by this species for nesting: smooth vertical walls and the underside of the bridge provide an excellent false cave or rock face.

Both sites were found by accident, Site 1 in 2002 by T. Ukizintambara, who informed PC in 2003, and Site 2 (year unknown) by G. Mabeka, who told FM in 2002. The nest at Site 1 (Fig. 1) was *c.* 75 cm long and 30 cm wide; that at Site 2 (Fig. 2) was shorter (about 40 cm long) and more typical of the species (about as long as it is wide: the exterior is usually 40 cm long and 29 wide (Ash 1991). Exact measurements were not taken as both nests were high up on the faces of the bridges (see hand and head for scale in Figs 1 and 2). The road over the first bridge is a main road used by trucks and other vehicles; the second road is almost never used: perhaps once every year. The vibrations caused by traffic over the first bridge may explain the long, very robust construction of the associated nest. Both bridges are over running

water in very narrow gallery forests in savannas in the northern sector of the Lopé NP. For the first site, access to the nest is easy from both sides, whereas for the second, access from the upstream side is blocked by vegetation.

We do not know how successful these sites are in comparison to nests at natural rock face sites, but they have been used for several years. It is possible that *P. oreas* regularly makes nests under such constructions, but that no-one has thought to look. This is good news for the species, as it means that their nesting opportunities are broader than previously supposed.

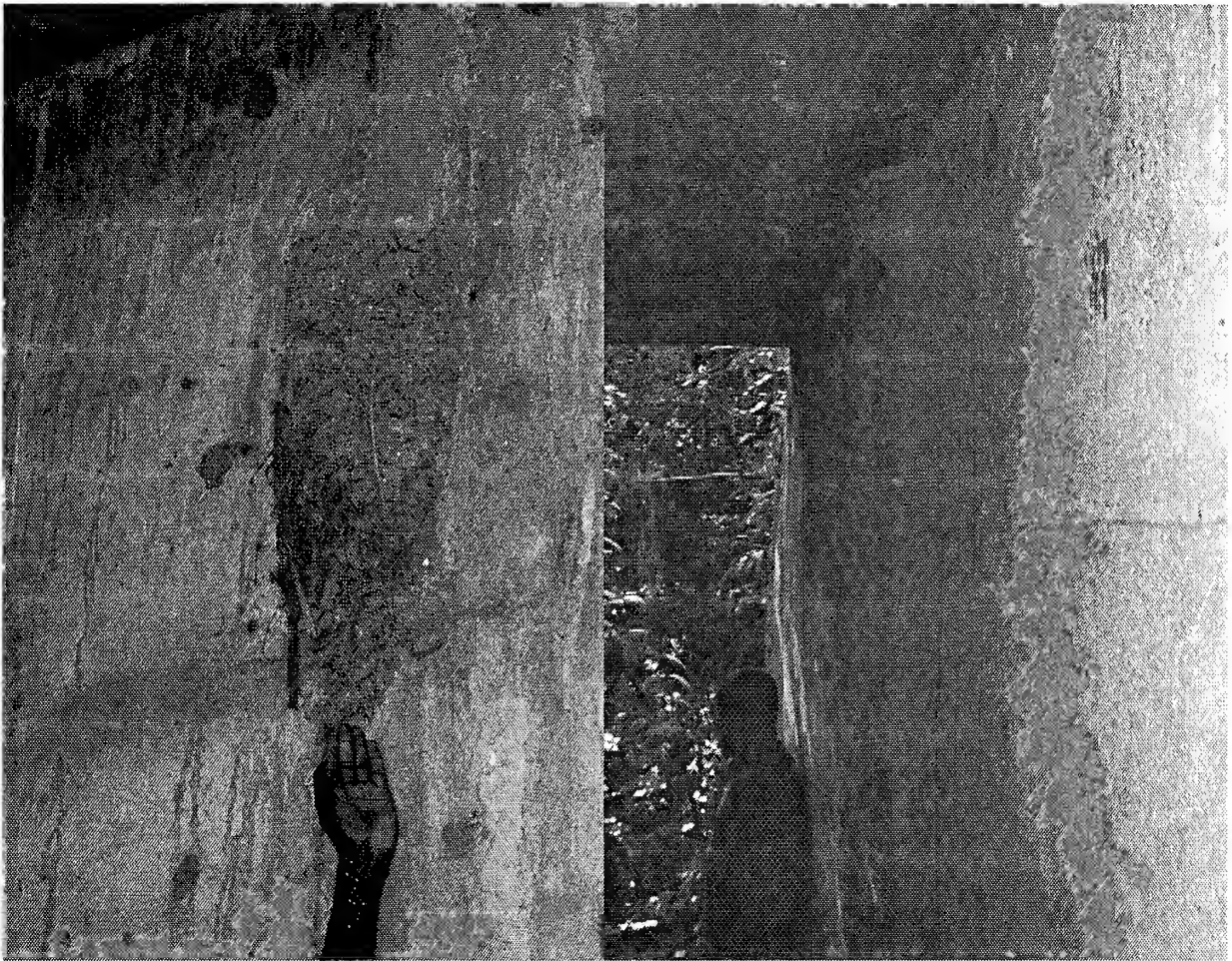


Fig 1. Site 1.

Fig 2. Site 2.

Thanks to the Conseil National des Parcs Nationaux and the Ministère des Eaux et Forêts, Gabon. We are grateful to Guy Mabeka of Malouma village and Tharcisse Ukizintambara for passing on this information to us.

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Received 13 April 2007

Revised 31 July 2007

Patrice Christy¹ & Fiona Maisels²

¹BP 2240, Libreville, Gabon

²Wildlife Conservation Society, BP 7847, Libreville, Gabon

Seabird counts at N’Gor, Senegal, in November 2006

During a visit to Senegal in 2006 we spent seven days (10–14 and 25–26 Nov) at N’Gor on the north end of the Cap Vert peninsula to watch the migration of seabirds. We mostly observed from north of Dakar airport, close to N’Gor island, with a view to the north which gave reasonably good views of the WSW-migrating seabirds, even when the winds were moderate. During 10 Nov we counted Cory’s Shearwaters *Calonectris diomedea* passing per minute in different periods; on the other days we counted all passing birds. The mornings were mostly clear and good numbers of seabirds passed within 1000 m, with the first two hours the best of the day. As the day proceeded, the visibility and greater distance to the birds made it less profitable to watch. The evenings were also good, especially on 25 Nov when the wind was more from the north than northeast and with wind speed exceeding 10 ms⁻¹. Observations are summarized in Table 1.

Many Cory’s Shearwaters passed southwest during days with northeast winds, with means of 50 per min. in the morning and 10–15 in the afternoon. On several occasions we had >100 per min. in the morning and some flocks of several hundreds passing. A low estimate of the number of Cory’s Shearwater passing N’Gor during 10 Nov is at least 15000 birds. We did not observe any Cape Verde Shearwaters *C. (diomedea) edwardsii*, despite close attention. The prevailing northeast winds might have prevented them from reaching the coast during the period, or they might not occur regularly at this season. The number of migrating Cory’s Shearwater peaks at the Cap Vert peninsula in Nov, with the largest number reported being 3146 in 1 h, in Nov 1991 (Sauvage & Rodwell 1998). Our 4500 birds in 1h 20 min. on 10 Nov therefore a new highest count.

The observations of Great Shearwater *Puffinus gravis*, a rarely observed passage migrant (Brown *et al.* 1982, Sauvage & Rodwell 1998, Borrow & Demey 2004),

Table 1. Numbers of passing seabirds at N’Gor, Senegal 10–14 and 25–26 Nov 2006. * = juvenile birds.

	Date														Totals
	10	10	11	12	13	13	14	25	25	26	26	26	26	26	
Time	8h30–9h50	13h30–19h30	7h05–9h05	6h55–19h00	7h30–8h15	16h20–18h30	7h05–12h00	7h05–10h05	17h00–18h50	7h00–7h40	8h15–9h40	8h15–9h40	8h15–9h40	8h15–9h40	
<i>Calonnetris diomedea</i> Cory’s Shearwater	4500	3500	801	866	182	259	551	76	376	112	850	12000			
<i>Puffinus griseus</i> Sooty Shearwater	4	14	27	45	1	7	4	51	43	4	15	215			
<i>P. gravis</i> Great Shearwater									8		3	11			
<i>Morus bassanus</i> Northern Gannet				1*					12*	1*	1*	15			
<i>Catharacta</i> sp.larger skuas		3		3					2			8			
<i>Stercorarius pomarinus</i> Pomarine Skua	6	54	68	49		99	12	22	55	1	33	399			
<i>S. parasiticus</i> Arctic Skua	1*	29	7	5			1*		7	1*		51			
<i>S. longicaudus</i> Long-tailed Skua				1*								1			
<i>Larus sabini</i> Sabine’s Gull		59*	10*	16*					10*			95			
<i>L. fuscus</i> Lesser Black-backed Gull	1*	3*	1*	2*								7			
<i>L. audouinii</i> Audouin’s Gull			11	15				2				28			

during the evening of 25 Nov and morning 26 of Nov, were made during north winds of 10–12 ms⁻¹. The passage off W Europe is mainly Aug–Oct (Harrison 1983) but the majority of observations in Senegal are made in Nov (*e.g.* Sauvage & Rodwell 1998).

Several observations were made of larger skuas *Catharacta* sp., possibly South Polar Skuas *C. maccormicki*. They were all dark with no rufous coloration showing in the plumage (as often showed by juvenile Great Skuas *C. skua*) even in very good light.

All Sabine's Gulls *Larus sabini* that passed during our visit were juveniles, which may be explained by the late date.

Thanks to P.W.P. Browne for valuable and constructive comments on the manuscript.

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Received 13 January 2007

Revised 13 April 2007

Roine Strandberg¹ & Patrik Olofsson²

¹Department of Animal Ecology, Lund University, SE-22362 Lund, Sweden.

<roine.strandberg@zooekol.lu.se>

²Furubodavägen 73, SE-29692 Yngsjö, Sweden.

Baumann's Greenbul *Phyllastrephus baumanni*, new to Cameroon

While studying understorey birds in primary forest, secondary forest, cocoa, coffee and annual crops in the area of Abat-Mgbegati-Basu (5°21'–5°25'N, 9°9'–9°13'E), near Korup National Park in SW Cameroon, at *c.* 250 m altitude, from 16 January to 7 March 2006, we mist-netted four greenbuls, within small (*c.* 100 m in diameter) annual crop farms left fallow for at least two years. These still held cassava plants but were overgrown by *Chromolaena odorata* of *c.* 2.5 m height. The birds (photographed) were slightly bigger than Little Greenbul *Andropadus virens*, dark olive-brown above but with the tail more rufous-brown, light brown-grey below but with a paler throat. They had brown-orange eyes, grey-brown sides of the head with light streaks and supercilium, olive-brown eye-stripes, black whiskers and dark grey feet. The lower mandible was paler than the upper mandible, which was dark grey.

The first bird caught (23 Feb at 15h30), an adult female (cloaca and brood patch) measured: wing 80 mm (moulting); tail 77; tarsus 23; bill length to feathering 15 mm, depth 5.5, width 6.5; total length 18.5 cm; weight 31 g).

The birds were eventually identified as Baumann's Greenbul *Phyllastrephus baumanni*. Pale Olive Greenbul *P. fulviventris* and Cameroon Olive Greenbul *P. poensis* are similar, but differ by having, for *P. fulviventris*, a creamy-white throat, pale tawny-yellow underparts with pale olive-brown breast and flanks, and a broken white eye-ring, and for *P. poensis*, a relatively longer tail, pale dirty olive-grey underparts with whitish throat (Borrow & Demey 2001). Brown Illadopsis *Illadopsis fulvescens*, of which we caught five individuals in secondary forest plots, is more compact, lacks whiskers, has a shorter tail and is dark fulvous-brown above, wholly fulvous-brown below (*I. f. iboensis*).

The first individual caught (at 5°22'10''N, 9°12'50''E) called in the hand, and others in the nearby farms responded and approached. In the field, we used the call description in Borrow & Demey (2001) to confirm Baumann's Greenbul, which was calling "shrr week wik". We later discarded *P. fulviventris* and *P. poensis* from their calls on Chappuis (2000). On 24 Feb in the same plot, the same female was caught again. On 25 Feb, late in the afternoon, in another farm plot c. 300 m south of the first one, a male was caught, with primary feathers starting to moult. On 7 Mar about noon an adult female was caught in a plot c. 200 m west of the first plot, with primary moult completed and with a fresh egg still in the abdomen but visible from the completed brood patch. In the afternoon of the same day, an adult male was also caught in this plot.

According to Fishpool (1999, 2000), the species does not occur in true lowland rainforest, but in severely degraded forest with a low canopy and in gallery forest and thickets fringing the forest zone. Baumann's Greenbul is Data Deficient (BirdLife International 2004). In our study area, it appeared to be frequent in suitable habitat, where 3–4 pairs per ha could be found. March seems to be the beginning of its breeding season. These first sightings of Baumann's Greenbul in SW Cameroon represent an eastward range extension, the nearest known locality being in E Nigeria, c. 100 km from our study area (Borrow & Demey 2001, BirdLife International 2004). This increases the number of species known for Cameroon (cf. Languy *et al.* 2005).

Our sincere thanks to Dr. Volker Dinse, Sven Baumon and Kirsten Heyer from the "Reit" ringing station in Hamburg and to Dr. Ulrich Querner from the Radolfzell ringing station, in Germany for providing the nets. We also thank the German Society for Tropical Ornithology (GTO) for financial support. Our sincere gratitude to Ron Demey for his corrections and comments.

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Received 26 April 2006; revised 28 May 2007.

K.S. Bobo^{1,4}, F.M. Njie², S.E. Mbeng³, M. Mühlenberg⁴ & M. Waltert⁴

¹Ministry of Environment and Forestry, Department of Wildlife and Protected Areas.
Yaounde, Cameroon; <bobokadiri@yahoo.fr>

²c/o Limbe Botanical Garden, Cameroon; <njiefrank@yahoo.com>

³Abat, Korup National Park, P.O. Box 36, Mundemba, Southwest Cameroon

⁴Department of Conservation Biology, Centre for Nature Conservation,
Georg-August University, Von-Siebold-Strasse 2, 37075 Göttingen, Germany

Society Notices — Informations de la Société

Increase in W.A.O.S. subscription rate

The W.A.O.S. membership subscription was last increased more than 15 years ago, in 1991. Since then, we have produced *Malimbus* each year and disbursed almost £4000 in research grants to ornithologists working in W Africa, mostly students of W African origin. We have also established a Society web site, put most issues of *Malimbus* onto it, and are currently adding to it all issues of the *Bulletin of the Nigerian Ornithological Society*.

Increasing costs have at last led to Council having decided that the subscription must increase, and the following new rates will apply for 2008: Ordinary Members £15 or €22; Corporate and Supporting Members £30 or €44.

For members paying by Standing Order, a notice to your bank is enclosed with this issue. Please complete this and hand it to your bank.

W.A.O.S. Council

Augmentation de la cotisation à la S.O.O.A.

La dernière augmentation du montant de la cotisation de membre de la S.O.O.A. remonte à plus de 15 ans (1991). Depuis lors, nous avons publié *Malimbus* chaque année et versé environ £4000 en bourses de recherche à des ornithologues travaillant en Afrique de l'Ouest, la plupart à des étudiants des pays en question. Nous avons aussi créé un site Internet pour la Société, sur lequel nous avons mis la plupart des numéros de *Malimbus*, et nous sommes en train d'y ajouter tous les numéros du *Bulletin of the Nigerian Ornithological Society*.

L'augmentation des frais a finalement conduit le Conseil à décider d'une augmentation nécessaire du montant de la cotisation, dont le nouveau tarif suivant sera appliqué à partir de 2008: Membres Ordinaires £15 ou €22; Sociétés et cotisations de soutien £30 ou €44.

Pour les membres payant par ordre de virement permanent, un ordre de virement est joint à ce numéro. Merci de le compléter et de l'adresser à votre banque.

Le Conseil de la S.O.O.A.

Electronic communication

The Society may on occasion wish to communicate with its members by e-mail. All members are therefore requested to send their current e-mail address to the Secretary,

Joost Brouwer <brouwereac@wanadoo.nl>, and notify him in future of any changes. The addresses will be for Council use only.

W.A.O.S. Council

Communication électronique

La Société peut à l'occasion avoir à communiquer avec ses membres par mèle. Il est donc demandé à tous les abonnés d'envoyer leur adresse électronique actuelle au Secrétaire, Joost Brouwer <brouwereac@wanadoo.nl>, et de l'informer de tout changement éventuel. Ces adresses seront à l'usage exclusif du Conseil.

Le Conseil de la S.O.O.A.

New Treasurer and Membership Secretary sought for W.A.O.S.

Because of the imminent retirement of Bob Sharland, the Society is looking for a new Treasurer and Membership Secretary. The work involved is straightforward: answer queries about membership, keep the membership list up to date, send reminders for overdue subscriptions, and keep the accounts. The W.A.O.S. accounts are also quite simple: income comprises subscriptions and bank interest, while the main expenditures are *Malimbus* production costs and occasional research grants. Sterling subscriptions are paid into the W.A.O.S. main bank account in the U.K., while Euro subscribers pay via Marie-Yvonne Morel's account in France. Marie-Yvonne records these subscriptions and every so often makes a transfer to the sterling account. Because the majority of transactions take place on the sterling account we are ideally looking for someone based in the U.K. to take over this position. Please inform the Secretary, Joost Brouwer (addresses inside front cover), of suitable candidates.

W.A.O.S. Council

Un nouveau Trésorier et Secrétaire des Adhésions, recherché pour la S.O.O.A.

En raison du départ imminent de Bob Sharland, la Société recherche un nouveau Trésorier et Secrétaire des Adhésions. Le travail demandé est simple: répondre aux demandes d'adhésion, tenir à jour la liste des adhérents, envoyer les rappels de cotisations en retard et tenir la comptabilité. Les comptes de la S.O.O.A. sont aussi très simples: les rentrées consistent en cotisations et intérêts bancaires tandis que les principales dépenses sont les frais d'édition de *Malimbus* et occasionnellement les bourses de recherche. Les cotisations en £ Sterling sont payées sur le compte bancaire

de la S.O.O.A. en Grande-Bretagne tandis que les adhérents en zone euro la paient sur le compte bancaire de Marie-Yvonne Morel en France. Marie-Yvonne enregistre ces cotisations et de temps à autre fait un virement sur le compte en livres sterling. Comme la majorité des transactions ont lieu dans la zone sterling, la personne idéale que nous recherchons pour ce poste devrait résider en Grande-Bretagne. Veuillez faire connaître au Secrétaire, Joost Brouwer (adresse sur la page intérieure de la couverture) les candidats.

Le Conseil de la S.O.O.A.

Appreciation of the contributions of Gérard J. Morel and C. Hilary Fry to the West African Ornithological Society

Retiring W.A.O.S. President Gérard Morel has served 28 years on the Council of the West African Ornithological Society, nine years as Vice-President and 19 as President. This is the whole life of W.A.O.S. and he was present at its birth. Prior to that, the only group of ornithologists in W Africa was the anglophone Nigerian Ornithologists' Society, who realized that true coverage of the region would involve becoming a bilingual group. Gérard was one of the principal francophone ornithologists who helped bring this about. The Society's journal, *Malimbus*, is a measure of the success of this effort. It has published, from the beginning, a mixture of English and French language pieces and all notices from the Society are in both languages. The same policy has been used on the Society's website. Not only has Gérard encouraged a bilingual Society in principle, but he has also contributed to that end on a day-to-day basis by translating into French much material for *Malimbus* that was initially composed in English.

Gérard realized that the success of the Society depends in large measure on the publication in *Malimbus* of important articles on W African ornithology. While working at the ORSTOM Ornithological Station at Richard-Toll, Senegal, he made his personal contribution to this with many papers, some jointly with his wife Dr. Marie-Yvonne Morel. He has also encouraged, through his wide personal contacts, other ornithologists to publish in the pages of *Malimbus* and has exhorted his French-speaking colleagues to publish in French. He has also contributed numerous book reviews to the journal.

After his retirement in 1992, he and Marie-Yvonne took up residence in Normandy, France. They were then better able to assist in the organisation of biannual Society meetings and meetings of Council. They also continued a task they had begun in Senegal, to collect subscriptions to the Society paid in French francs and later in Euros, to alleviate the problems some members had in paying in pounds sterling.

They played an important role in the conception of a website for the Society. In 2002, Council realized that a website could contribute significantly to success of the Society and the Morels were able to obtain the services of their grandson, Julien

Guyonet, to launch this endeavour in 2003. He was responsible for the striking graphics that adorn the main pages of the website, and he also set up the website on the server that is still used, costing the Society nothing.

Council has decided to nominate Gérard Honorary President. We are delighted that he will continue to participate in Council and give us the benefit of his advice and assistance. **Retiring W.A.O.S. Vice-President Hilary Fry** was, with Bob Sharland and John Elgood, a founder of the Nigerian Ornithologists' Society (N.O.S.), first established in 1964. Hilary took on editorship of the *Bulletin of the Nigerian Ornithologists' Society* while teaching at Ahmadu Bello University, Zaria, Nigeria and ably held this position whilst encouraging others to join and contribute to the Society and its Bulletin. On his leaving Nigeria in 1967 to take up appointment at the University of Aberdeen, Hilary resigned the editorship of the *Bulletin*, only to take it on again in 1974.

Having encouraged and solicited articles for *Bull. N.O.S.* from ornithologists in countries all over W Africa, it was a logical progression when in 1978 Hilary initiated a meeting of N.O.S. members and other W African ornithologists in Liverpool. This resulted in the West African Ornithological Society and its bilingual journal *Malimbus*. Hilary saw the society and journal through this important transformation and continued to edit *Malimbus* until 1985 when he moved to take on a new Chair at the Sultan Qaboos University, Oman.

Hilary is now best known for his mammoth work as editor and major contributor to the excellent multivolume standard work *The Birds of Africa*. This was an immense task ably accomplished and benefits all interested in African birds. He is the world authority on bee-eaters and, as well as the classic monograph *The Bee-eaters* (Poyser), wrote together with his wife Cathy the acclaimed *Kingfishers, Bee-eaters and Rollers* (Christopher Helm).

Hilary's return to W.A.O.S. as Vice-President in 1997 was greatly welcomed and he held that position under Gérard Morel's presidency until both recently retired in these capacities. As a Council member Hilary has always been constructive and sometimes challenging in his views and the Society has evolved and greatly benefited from his contributions. Council will be very different without him and we hope that in a less official capacity our Society may continue to benefit from his experience and foresight.

W.A.O.S. Council

Remerciements à Gérard J. Morel et à C. Hilary Fry pour ses rôles dans la Société d'Ornithologie de l'Ouest Africain

Le Président sortant de la S.O.O.A., Gérard Morel, a servi 28 ans au sein du Conseil de la Société Ornithologique de l'Ouest Africain, dont neuf ans comme Vice-Président et 19 ans comme Président. Soit depuis la création de la S.O.O.A. Auparavant, le seul groupe d'ornithologues en Afrique de l'Ouest était la Société des Ornithologues du Nigeria, anglophone, jusqu'à ce que l'on se rende compte qu'une

bonne couverture de la région impliquerait la constitution d'un organisme bilingue. Gérard fut l'un des ornithologues francophones qui aidèrent le plus à cette transformation. Le journal de la Société, *Malimbus*, permet de prendre la mesure de la réussite de cet effort. Il a publié, dès l'origine, des travaux dans les deux langues, anglaise et française, et toutes les annonces de la Société sont dans les deux langues. La même politique a été suivie pour le site Internet de la Société. Non seulement Gérard a soutenu le principe du bilinguisme de la Société, mais il a aussi participé à sa mise en œuvre quotidiennement en traduisant en français une bonne partie du contenu de *Malimbus* initialement rédigée en anglais.

Gérard a compris que la réussite de la Société dépendait dans une large mesure de la publication dans *Malimbus* d'articles importants sur l'ornithologie en Afrique de l'Ouest. Tout en travaillant à la Station Ornithologique de l'ORSTOM à Richard-Toll, au Sénégal, il a apporté sa propre contribution à cet objectif avec de nombreux articles, dont certains rédigés conjointement avec sa femme, Dr Marie-Yvonne Morel. Il a aussi encouragé, à l'occasion de ses nombreux contacts personnels, d'autres ornithologues à publier dans *Malimbus* et il a exhorté ses collègues francophones à le faire en français. Il a rédigé de nombreuses critiques de livres pour la revue.

Après son départ en retraite en 1992, lui et Marie-Yvonne s'établirent en Normandie, en France. Il leur fut ainsi plus facile d'aider à l'organisation d'assemblées biennales de la Société et de réunions du Conseil. Ils continuèrent aussi d'assumer une tâche qu'ils avaient initiée au Sénégal, la collecte de cotisations payées en Francs français et plus tard en Euros, pour alléger les frais de transfert en Livres sterling.



Gérard and Marie-Yvonne Morel on the Normandy coast. Gérard et Marie-Yvonne Morel sur la côte Normande. Photo : P.W.P. Browne.

Ils ont joué un rôle important dans la conception du site Internet de la Société. En 2002, le Conseil a pris conscience de ce qu'un site Internet pourrait contribuer significativement à la réussite de la Société et les Morel ont pu bénéficier des services de leur petit-fils, Julien Guyonet, pour démarrer ce projet en 2003. Il est l'auteur des remarquables illustrations qui agrémentent les pages principales du site Internet et a aussi créé le site Internet sur le serveur, encore utilisé, qui ne coûte rien à la Société.

Par décision du Conseil, Gérard a été nommé Président d'Honneur. Nous sommes très heureux qu'il continue ainsi à participer au Conseil de la Société et à le faire bénéficier de ses avis et de sa collaboration.

Le Vice-Président sortant de la S.O.O.A., Hilary Fry, a été, avec Bob Sharland et John Elgood, co-fondateur de la Société d'Ornithologie du Nigeria (N.O.S.), créée en 1964. Hilary prit en charge la rédaction du *Bulletin of the Nigerian Ornithologists' Society* alors qu'il enseignait à l'Université Ahmadu Bello, Zaria, Nigeria et il assumait cette responsabilité avec compétence tout en encourageant d'autres personnes à rejoindre la Société et à alimenter son *Bulletin*. Lors de son départ du Nigeria, en 1967, pour prendre un poste à l'Université d'Aberdeen, Hilary démissionna de la rédaction du *Bulletin*, mais ce fut pour la reprendre en 1974.

Après avoir stimulé les ornithologues de toute l'Afrique de l'Ouest et leur avoir demandé des articles pour le *Bull. N.O.S.*, ce fut pour Hilary une suite logique de convoquer la première réunion des membres de la N.O.S. et d'autres ornithologues d'Afrique de l'Ouest à Liverpool. La Société d'Ornithologie de l'Ouest Africain en résulta, ainsi que sa revue bilingue *Malimbus*. Hilary accompagna, pendant cette importante transformation, la Société et sa revue *Malimbus*, dont il continua d'être le Rédacteur en chef jusqu'en 1985, année où il partit occuper une nouvelle chaire à l'Université Sultan Qabous, à Oman.

Hilary est maintenant mieux connu pour son œuvre monumentale en tant que rédacteur et collaborateur majeur à l'excellent ouvrage de référence en plusieurs volumes *The Birds of Africa*. Ce fut une tâche immense accomplie avec compétence et dont profitent tous ceux qui s'intéressent aux oiseaux d'Afrique. Il est l'autorité mondiale pour les guépiers et, de même que la monographie classique *The Bee-eaters* (Poyser), écrivit conjointement avec sa femme Cathy l'ouvrage très applaudi *Kingfishers, Bee-eaters and Rollers* (Christopher Helm).

Le retour d'Hilary à la S.O.O.A. comme Vice-Président en 1997 fut chaleureusement accueilli et il occupa ce poste sous la présidence de Gérard Morel jusqu'à la récente démission de ces deux derniers. En tant que membre du Conseil de la S.O.O.A., Hilary a toujours été constructif, parfois provocant, et la Société a largement bénéficié de ses apports au cours de son évolution. Le Conseil sera très différent sans lui et nous espérons que de manière moins officielle notre Société pourra continuer à bénéficier de son expérience et de sa perspicacité.

Le Conseil de la S.O.O.A.

New Secretary to W.A.O.S. Council

As announced in the last *Malimbus* (29: 55–58), the search has continued for a new Secretary to replace Roger Wilkinson, who was elected Vice-President early in 2007. Council is pleased to announce that Dr Joost Brouwer has accepted the position and has already begun to take part in Council affairs and decisions. Dr Brouwer has been a member of W.A.O.S. for many years, and a frequent contributor and referee of papers published in *Malimbus*. We look forward to his broader involvement in the management of the Society.

Born in Indonesia, the son of Dutch biology and geography teachers, Joost grew up birdwatching in various countries but opted for a research career in agricultural science. During a five-year stint in Australia he was chairperson of the Conservation Committee of the R.A.O.U. (now Birds Australia), and initiated and edited the first edition of *Threatened Birds of Australia* (Brouwer & Garnett, eds, 1990, R.A.O.U., Moonee Ponds). The next five years he spent in agricultural research in Niger, in his free time helping Wim Mullié set up the annual Waterbird Census in Niger. Since leaving Niger in 1994 Joost has coordinated the IBA chapter on Niger in *Important Bird Areas in Africa and Associated Islands* (Fishpool & Evans, eds, 2001, BirdLife International, Cambridge), started the Niger Bird Database (20,000 records), and written the chapter on natural history in the recent Bradt Travel Guide to Niger. He has been a member of W.A.O.S. since 1990 and contributed a number of papers on the birds of Niger. He presently runs his own consultancy on environmental and agricultural matters in developing countries.

W.A.O.S. Council

Nouveau Secrétaire au Conseil de la S.O.O.A.

Comme il était annoncé dans le dernier *Malimbus* (29: 55–56), la recherche d'un nouveau Secrétaire s'est poursuivie pour remplacer Roger Wilkinson, élu Vice-Président début 2007. Le Conseil est heureux d'annoncer que le Dr Joost Brouwer a accepté le poste et a déjà commencé à participer aux affaires et aux décisions du conseil. Le Dr Brouwer est membre de S.O.O.A. depuis de nombreuses années et a fourni ou revu souvent des articles publiés dans *Malimbus*. C'est avec sympathie que nous attendons son plus ample engagement dans la gestion de la Société.

Né en Indonésie et fils de professeurs néerlandais de biologie et de géographie, Joost grandit en observant les oiseaux dans différents pays mais opta pour une carrière de recherche agronomique. Durant un séjour de cinq ans en Australie il présida le Comité de Conservation de R.A.O.U. (à présent Birds Australia), et fut l'instigateur et l'éditeur de la première édition de *Threatened Birds of Australia* (Les Oiseaux menacés d'Australie: Brouwer & Garnett, eds, 1990, R.A.O.U., Moonee Ponds). C'est au Niger qu'il passa les cinq années suivantes dans la recherche

agronomique, aidant au cours de ses temps libres Wim Mullié à faire les recensements annuels de sauvagine (Waterbird Census). Après son départ du Niger en 1994 Joost coordonna le chapitre IBA sur le Niger de *Important Bird Areas in Africa and Associated Islands* (Fishpool & Evans, eds, 2001, BirdLife International, Cambridge), lança la base de données des oiseaux du Niger (Niger Bird Database, 20 000 données) et écrivit le chapitre sur l'histoire naturelle dans le récent guide de voyage au Niger de Bradt. Il est membre de S.O.O.A. depuis 1990 et écrit bon nombre d'articles sur les oiseaux du Niger. Actuellement, il a son propre cabinet d'expert-conseil en environnement et en agronomie dans les pays en voie de développement.

Le Conseil de la S.O.O.A. ;



Dr Joost Brouwer, new W.A.O.S. Secretary — nouveau Secrétaire de la S.O.O.A.

Instructions aux Auteurs

Malimbus publie des Articles, des Notes Courtes, des Revues de Publications et des Nouvelles & Lettres traitant de l'ornithologie ouest-africaine.

Les **Articles** et les **Notes Courtes** doivent être des apports originaux; ceux déjà publiés ailleurs, en partie ou en totalité, seront normalement refusés. Les Notes Courtes sont des articles de moins de 1500 mots (références comprises) ou de trois pages imprimées. Autant que possible, les manuscrits auront été au préalable soumis à au moins un ornithologue ou biologiste pour un examen minutieux. Les manuscrits seront envoyés pour critique à au moins un lecteur compétent.

Les textes des **Nouvelles & Lettres** ne devraient pas dépasser 1000 mots.

Les **textes** sont acceptés en anglais et en français; la Rédaction pourra aider les auteurs dont la langue maternelle n'est pas l'une de celles-ci. Nous préférons les envois de manuscrits par email (en pièce jointe). Consultez le Rédacteur pour plus de détails, par ex. les logiciels compatibles. Pour les envois sur papier, les textes seront tapés en deux exemplaires, d'un seul côté de la page, avec double interligne et larges marges.

Tous les Articles (mais non les Notes Courtes) comporteront un **Résumé**, n'excédant pas 5% de la longueur totale. Le Résumé mentionnera brièvement les principaux résultats et conclusions de l'Article et ne sera pas un simple compte rendu de ce qui a été fait. Les résumés seront publiés à la fois en anglais et en français et seront traduits au mieux par la Rédaction.

La **présentation** des tableaux, chiffres, unités métriques, références, *etc.* doit correspondre à celles des numéros récents. A notez, en particulier: les dates seront écrites "2 fév 1990" mais les mois seuls pourront être écrits en entier; les heures seront écrites "6h45", "17h00"; les coordonnées "7°46'N, 16°4'W" (pas de zéros en tête); les nombres jusqu'à dix seront écrits en toutes lettres, excepté devant une unité de mesure (ex. 6 m); les nombres à partir de 11 seront écrits en chiffres sauf au début d'une phrase. Toutes les références citées dans l'article, et aucune autre, doivent figurer dans la bibliographie.

Les **articles sur l'avifaune** doivent comprendre une carte ou un index géographique, incluant tous les endroits cités. Ils doivent comporter quelques brèves indications sur le climat, la topographie, la végétation et les circonstances ou événements inhabituels avant ou pendant l'étude (ex. pluies tardives, *etc.*). Les **listes d'espèces** ne doivent contenir que des données importantes: les listes complètes ne sont justifiées que pour les régions encore non étudiées ou délaissées pendant long-temps. Autrement, ne citer que les espèces sur lesquelles l'étude fournit une information nouvelle sur la répartition, la période de séjour, la reproduction, *etc.* Pour chaque espèce, indiquer l'extension de l'aire de répartition, une estimation d'abondance (*Malimbus* 17: 38) et les données datées sur la reproduction; indiquer le statut migratoire et la période de séjour seulement telles qu'elles ressortent de l'étude. Eventuellement, replacer les données dans le contexte en les comparant brièvement avec une liste régionale de référence. Les longues listes d'espèces peuvent être présentées sous la forme de tableaux (ex. *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) ou sous la forme rédigée des numéros récents. La **séquence taxonomique** et les **noms scientifiques** (et de préférence aussi les **noms vernaculaires**) doivent suivre Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), ou Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) ou The Birds of Africa (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), à moins de donner les raisons de s'écarter de ces auteurs. Un **guide plus complet à l'intention aux auteurs** d'articles sur l'avifaune, comprenant l'échelle d'abondance des espèces conseillée, a été publié dans *Malimbus* 17: 35–39 et une version augmentée et actualisée de celle-ci mise sur le site Internet (<http://malimbus.free.fr/instmale.htm>). On peut en obtenir une copie de la Rédaction, qui se fera un plaisir de donner des conseils pour les études spécifiques.

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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain

**Happy 10th
decade to
Bob Sharland**

(see p. 83)



VOLUME 30 Number 1

ISSN 0331-3689

March 2008

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

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Correspondence should be addressed as follows:

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The birds of the Soyo area, northwest Angola

by W.R.J. Dean¹ & D.C. Le Maitre²

¹DST/NRF Centre of Excellence at the Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch, 7701 South Africa

²Natural Resources and Environment, CSIR, PO Box 320, Stellenbosch, 7599 South Africa

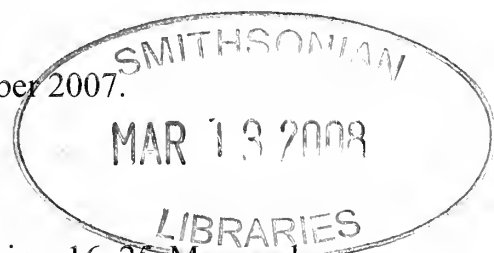
Received 4 December 2006; revised 14 October 2007.

Summary

At Soyo (6°8'S, 12°22'E), Zaïre Province, Angola, during 16–25 May and 17–24 Oct 2006, 114 bird species were recorded. The area is a mosaic of woodlands, sub-littoral savanna and wetlands, and remnant forest patches. The coastal fringe, where most observations were made, is littoral steppe, thicket and savanna including palm savanna, on sands. Bird species richness and abundance were low, possibly due to post-breeding dispersal and the general dryness of the area. There was little bird breeding activity, and few plants flowering and fruiting. New records extend known ranges south from Cabinda or fill the gap between Bengo Province and Cabinda, for Red-backed Mousebird *Colius castanotus*, Broad-billed Roller *Eurystomus glaucurus*, Crowned Hornbill *Tockus alboterminatus*, Arrow-marked Babbler *Turdoides jardineii* and Brown Sunbird *Anthreptes gabonicus*.

Résumé

Les oiseaux de la région de Soyo, au Nord-Ouest de l'Angola. Il a été recensé 114 espèces d'oiseaux à Soyo (6°8'S, 12°22'E), province du Zaïre, Angola, au cours des périodes du 16–25 mai et du 17–24 oct 2006. La région est une mosaïque de marécages et de savane sub-littorales, de bois, ainsi que de zones forestières relictuelles. La frange côtière, où la plupart des observations ont été faites, est constituée de steppe littorale, de fourrés et de savane, y compris de savane à palmiers, sur des sols sableux. La richesse spécifique et l'abondance des oiseaux étaient faibles, peut-être en raison de la dispersion après la reproduction et de la sécheresse dans la région. Il y avait peu de reproduction d'oiseaux, et peu de plantes en fleurs ou portant des fruits. Les observations nouvelles étendent les aires de répartition connues au sud de Cabinda ou comblent le vide entre la province de Bengo et Cabinda pour le Coliou à dos roux *Colius castanotus*, le Rolle violet *Eurystomus glaucurus*, le Calao couronné *Tockus alboterminatus*, le Cratérope fléché *Turdoides jardineii* et le Souimanga brun *Anthreptes gabonicus*.



Introduction

The avifauna of Soyo, Zaïre Province, NW Angola (6°8'S, 12°22'E), is poorly known (Dean 2000). Only 25 species have been collected in the area, some during the late 1800s (probably by A. Lucan and L. Petit: Sharpe & Bouvier 1876, 1877, 1878) but mostly by Rudyerd Boulton between 7 and 9 August 1957, who collected 19 species labelled "San Antonio" (= Soyo), presumably from around the town and surrounding palm savanna, mangroves, woodland and the forest remnants.

From 16 to 24 May and 17 to 23 Oct 2006, WRJD surveyed birds in different habitats around Soyo, including Kwanda Base, situated on the south bank of the Congo River on the western edge of the town. We present a list of birds seen and include a few records of birds recorded by DCLM in January 2005 during a survey of the vegetation. Not all the places visited in May were visited in October, when some new areas were explored, including the edges of some forest patches east and southeast of Soyo. For various reasons, mainly security and the suspected presence of unexploded devices, the interior of remnant forest patches was not sampled. The terrestrial habitats seemed poor in soil nutrients and plant species, with most dry habitats being of rather low-growing rank vegetation, with few patches of trees. The sandy soils appear to be well drained and probably lose nutrients quickly through cultivation and fire. The grass layer has a high percentage cover of unpalatable sedges. The seemingly low nutrient status of the soils is supported by the condition of crops; most cassava, bean and sesame plants seen in cultivated patches were variable in size across and along rows, generally stunted and showed signs of nutrient stress.

Species richness and abundance of birds in May seemed generally low, but this could have been due to post-breeding dispersal and the general dryness of the area. Furthermore, by May, intra-African breeding migrants would have departed for their non-breeding areas, and Palaearctic migrants would have passed through the area at least a month prior to the survey. Even in October the area was very dry and there was very little bird breeding activity, and few plants flowering and fruiting, which would affect the movements of locally nomadic bird species dependent on these resources. Palaearctic migrants were scarce at this time.

Bird species collected at Banãna (6°0'S, 12°16'E), about 18 km northwest of Soyo across the Congo River, and at Muanda (5°56'S, 12°21'E), 8 km northwest of Banãna, both in the Democratic Republic of Congo, and that could potentially occur at Soyo are listed in Appendix 1. Species collected and recorded at N'Zeto (7°14'S, 12°52'E) and Ambriz (7°50'S, 13°6'E), south of Soyo in Zaïre Province, Angola, and which have similar habitat to Soyo are listed in Appendix 2. It is evident that for some species the lower Congo River forms an effective barrier. We have noted whether species have been collected on both sides. What is uncertain, however, is whether species that were recorded at Soyo but not at Banãna, Muanda or elsewhere in W *Neder-Congo* (Schouteden 1948–58) do not occur there or whether their absence from lists is simply due to poor coverage by collectors. We suspect the latter.

Museum collections from which we have drawn data are: Field Museum of Natural History, Chicago (FMNH), Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK), Museum National d'Histoire Naturelle, Paris (MNHN), Peabody Museum of Natural History, New Haven, the Royal Museum for Central Africa, Tervuren (RMCA), and The Natural History Museum, Tring (BMNH).

Bird habitats

The vegetation of the area was surveyed by DCLM in 2005. The area falls into the Guineo-Congolian/Zambezian transition zone (White 1983), and is a mosaic of moist forest, sub-littoral savanna and wetlands. Plants of this zone include Baobab *Adansonia digitata*, Monkey Apple *Strychnos henningsii*, *Acacia* spp. and *Hyparrhenia* and *Setaria* grasses. The coastal fringing vegetation is littoral steppe, thicket and savanna, including palm savanna, on quaternary marine sand deposits (Grandvaux Barbosa 1970). Descriptions of the similar communities north of the Congo River are given by Duvigneaud (1949) and Lebrun (1954).

The palm savanna is dominated by Lala fan palms *Hyphaene guineensis* with patches of poorly drained swamp grasses, thickets and tall shrubs and rank tall grasses on drier patches between clumps of palms. There are scattered Baobabs and other trees, including figs *Ficus* spp., *Albizia gummifera* and occasional Kapok *Ceiba pentandra* and Cashew *Anacardium occidentale* trees. Adjacent to mangrove creeks there are also Coconut *Cocos nucifera* and Wild Date palms *Phoenix reclinata*, *Hibiscus tiliaceus*, *Dalbergia ecastaphyllum* and *Drepanocarpus lunatus*.

Thickets form extensive or small, scattered patches of 2–5 m tall shrubs and trees with woody scrambling species and climbers, surrounded by grasslands. The tall grassland bears the scars of intensive agricultural use and frequent fires, and is a mosaic of current and abandoned cultivated and burned patches of various ages and stages.

Mangroves are abundant, as almost continuous belts along the edges of the Congo River and the creeks reaching into the palm savanna. The main species are *Rhizophora racemosa* and *R. harrisonii*, with *Avicenna germinans* in smaller creeks. Other species present on the landward edge of the mangrove patches include *Laguncularia racemosa*, *Conocarpus erectus* and *Hibiscus tiliaceus*. Much of the mangrove community is not much more than about 5 m tall, but in sections of the creeks with freshly deposited sediments, mangroves reach 20 m or more, and provide nest sites for Palm-nut Vultures *Gypohierax angolensis* and possibly Woolly-necked Storks *Ciconia episcopus*.

Systematic list

Order and nomenclature follows *The Birds of Africa* (1982–2004), with a few scientific names corrected for gender or spelling. We have included, in square

brackets, species not seen during the survey but reliably reported by persons at Kwanda Base, or collected at Soyo in about 1876 (specimens in the Museum National d'Histoire Naturelle, Paris, precise dates and collectors not clear: Sharpe & Bouvier 1876, 1877, 1878), and during 7–9 Aug 1957 (specimens in FMNH collected by Rudyerd Boulton, labelled San Antonio, the former name of the town).

Phalacrocoracidae

Phalacrocorax africanus Reed Cormorant. Singles seen flying along the Congo River in the early part of every day, and perched on trees and mangrove roots. Very young juveniles suggested a breeding colony in the area. Collected at Banana (Schouteden 1948).

Anhinga melanogaster Darter. Singles seen in backwaters of the Congo River, Oct. Collected at Banana (Schouteden 1948).

Ardeidae

Bubulcus ibis Cattle Egret. Seen foraging on short grass patches and flying to roost in the evenings near the town, May and Oct. Present in low numbers in Jan 2005 (DCLM).

Butorides striata Green-backed Heron. Three records of single birds in swamps with dense grass cover and in mangroves along the edge of the Congo River, May. Collected at Banana and Muanda (Schouteden 1948).

Egretta garzetta Little Egret. One record in May, a single bird foraging with Sacred Ibises in a shallow swamp near Soyo. Seen every day in Oct, single birds foraging at a number of ponds adjacent to the river. Collected at Banana (Schouteden 1948).

E. alba Great Egret. Seen every day foraging at grassy swamps at several localities, May and Oct.

Ardea purpurea Purple Heron. Single birds seen flying towards the main stream of the Congo River pre-dawn every day in May and Oct. Collected at Banana (Schouteden 1948).

A. cinerea Grey Heron. Two records: one foraging with Great Egrets in a grassy swamp adjacent to Kwanda Base in May; a single bird at a pond on Kwanda Base in Oct. Collected at Banana (Schouteden 1948).

A. melanocephala Black-headed Heron. Two records: an adult and a juvenile perched in trees on the edge of the Congo River near Figo in May; a single bird foraging in short grassland in Oct.

A. goliath Goliath Heron. One on the edge of the Congo River at Kwanda Base in Jan 2005 (DCLM) and one at the same place in Mar 2006 (Brian Cleator pers. comm.). There are no recent records of the species north of the Cuanza River in Angola, and only an old record for Cabinda (Dean 2000). These records thus fill a gap in the distribution of the species.

Scopidae

Scopus umbretta Hamerkop. Seen every day in May and Oct, usually flying over Kwanda Base, but also foraging in swamp patches and shallow waters along the Congo River. At least 16 present at a roost in swampy palm savanna in May. Several

nests in baobab trees southwest of Soyo, May and Oct. Collected at Banana (Schouteden 1948) and Muanda (RMCA).

Ciconiidae

Mycteria ibis Yellow-billed Stork. A group of five adults and two juveniles at a pond adjacent to the river, 18 Oct; thereafter pairs and groups of up to eight seen every day, either at ponds adjacent to the Congo River or flying along the river. Collected at Banana (Schouteden 1948).

Ciconia episcopus Woolly-necked Stork. Seen every day in May, but not recorded at all in Oct. Frequently seen flying to roost in tall mangroves and seen roosting on palms, and commonly foraging at short-grass swampy and muddy patches. Groups of up to six often seen, frequently associating in similar numbers with Great Egrets and African Sacred Ibises in foraging flocks. Collected at Banana (RMCA).

Threskiornithidae

Bostrychia hagedash Hadedda. Not heard or seen in May, but heard and seen every day in Oct, flying along the edge of mangrove forests and over open woodland southwest of Soyo. Collected at Banana (RMCA).

Threskiornis aethiopicus Sacred Ibis. Seen every day in May and Oct, foraging at shallow swamps, on garbage heaps and flying to roosts in the evenings.

Platalea alba African Spoonbill. One record in May, a group of nine flying to a roost; seen daily in Oct, foraging at shallow waters or flying to roosts. Collected at Banana (RMCA).

Anatidae

Dendrocygna viduata White-faced Whistling-Duck. Seen every day in May, all sightings associated with the Congo River: groups of up to six at shallow swampy patches on the edge of the river; groups of up to eight flying along the river; smaller groups foraging on the sandy shore. Not seen or heard in Oct.

Accipitridae

Pandion haliaetus Osprey. One perched on top of a tall riverside mangrove, 20 May; a single flying along the Congo River, 20 May; one at Sereia beach, 23 Oct.

Macheiramphus alcinus Bat Hawk. One hunting over woodland on the east end of Kwanda Base at dusk, 17 Oct. Recorded at Boma (5°51'S, 13°3'E) (Chapin 1932) and near Matadi (7°46'S, 13°4'E) in the DRC (Chapin 1932, Schouteden 1948).

Elanus caeruleus Black-shouldered Kite. Two individuals at different cultivated patches southwest of Soyo, 18 May. Not seen in Oct.

Milvus migrans parasitus Yellow-billed Kite. One flying along the river, 20 May; one hunting over mangroves and palm savanna, 24 May. In Oct, seen every day over Kwanda Base, and over Soyo and surrounding villages. Collected at Banana (Schouteden 1948).

Haliaeetus vocifer African Fish-Eagle. Pairs and singles seen high in the air and heard calling throughout the area, including over open woodland, every day in May. Less often seen in Oct, with only scattered records of birds perched along the Congo River.

Gypohierax angolensis Palm-nut Vulture. Seen over palm savanna and patches of baobab woodland, and particularly along the edges of the Congo River, frequently dropping to

inspect objects on the water surface, or scavenging dead fish from the water and shore. More visible in May than Oct, foraging along the Congo River, with similar proportions of adults and subadults but fewer juveniles in Oct. Counts in May (see Dean 2006 for methods) showed 55% adults, 28% subadults and 17% first- or second-year birds ($n = 132$) (Dean 2006). Counts in Oct, using the same methods, showed 63% adults, 36% subadults and 8% juveniles ($n = 63$). The sampling method (counting birds flying downstream only) does not allow the difference to be tested statistically, since birds in certain age groups may have circled back unseen resulting in repeat counts of the same individual. Breeding records include: two birds building a nest in a tall mangrove southwest of Soyo, one bird sitting as though incubating and the other bringing nest material, 19 May 2006; single birds carrying nest material in palm savanna west of Soyo, 20 and 21 May; two nests with adults in attendance in tall mangroves near Kwanda Base, 21 Oct 2006; nests with adults in attendance high in baobab trees southwest of Soyo, 21 Oct. *Polyboroides typus* African Harrier-Hawk. A single adult, probably the same individual, at Kwanda Base 16 and 19 May. Several records of single birds circling over Soyo and dry woodland southwest of Soyo in Oct.

Accipiter minullus Little Sparrowhawk. A single bird in mangroves, 21 Oct.

A. melanoleucus Black Sparrowhawk. One, an adult, probably female by size, perched high and prominently on a tall mangrove west of Soyo, 19 May.

Buteo auguralis Red-necked Buzzard. A pair and two single birds circling over woodland south of Soyo, 23 Oct. Collected at Banana (RMCA).

Lophaetus occipitalis Long-crested Eagle. One seen flying across open swamp grass in palm savanna, 19 May; a single bird circling over forest south of Soyo; 23 Oct. Schouteden (1948) has no records closer to Soyo than Boma, DRC.

Falconidae

Falco ardosiaceus Grey Kestrel. One perched on a tree in open, recently burnt grassland southwest of Soyo, 18 May; one perched above a disused Hamerkop nest in a baobab, 23 May. Seen more often in Oct, with single birds perched in dry woodland southwest of Soyo, 20 Oct. Seen every day on Kwanda Base, where a pair was nesting in a Lala palm *Hyphaene guineensis*. An adult carrying lizard prey to feed an incubating female or chicks, 21 and 22 Oct.

Turnicidae

Turnix sylvaticus Kurrichane Buttonquail. Two individuals flushed at separate localities in tall grass in open woodland, 18 May. Collected at Muanda (RMCA).

Jacanidae

[*Actophilornis africanus* African Jacana. One on a patch of emergent aquatic vegetation on the edge of the Congo River near Kwanda Base in March (Paul Buys pers. comm.). Not previously recorded from Zaïre Province (Dean 2000) but collected at Banana (Schouteden 1949).]

Recurvirostridae

Himantopus himantopus Black-winged Stilt. A flock of 16 flying over the E end of Kwanda Base, 22 Oct.

Burhinidae

Burhinus vermiculatus Water Thick-knee. Six sightings in May, foraging on open spaces around houses at Kwanda Base and along the sandy shores of the river near Soyo. Two records of 3–4 birds roosting during the day at a muddy patch on the edge of the river. Collected at Banana and Muanda (RMCA).

B. capensis Spotted Thick-knee. A pair in dry grassland southwest of Soyo, 20 Oct. Collected at Banana (RMCA).

Glareolidae

Cursorius temminckii Temminck's Courser. A pair on a burnt patch in grassland southwest of Soyo, 18 May. Not seen in Oct. Collected at Banana (RMCA) and Muanda (Schouteden 1949).

Charadriidae

Charadrius tricollaris Three-banded Plover. At least five on the muddy margins of a pond in the E end of Kwanda Base, 18 Oct.

C. marginatus White-fronted Plover. Together with Three-banded Plovers at a pond on Kwanda Base, 18 Oct; single birds foraging along the sandy shore of the Congo River, 19–23 Oct. Collected at Banana (RMCA) and Muanda (Schouteden 1949).

[*Vanellus lugubris* Lesser Black-winged Lapwing. Collected at Soyo (Sharpe & Bouvier 1878).]

Scolopacidae

Numenius phaeopus Common Whimbrel. Two flying along the Congo River, 22 May. Scattered small groups and one larger group of 30 seen on the edge of the Congo River, 20–23 Oct. Collected at Banana (Schouteden 1949).

Tringa stagnatilis Marsh Sandpiper. One at a pond on the E end of Kwanda Base, 18 Oct.

T. glareola Wood Sandpiper. Up to three at ponds on the E end of Kwanda Base, 18–21 Oct. Collected at Banana and Muanda (RMCA).

Actitis hypoleucos Common Sandpiper. Single birds in mangroves along the Congo River, 22 Oct, and at ponds on the E end of Kwanda Base, 23 Oct. Collected at Banana (RMCA).

Laridae

Sterna maxima Royal Tern. Singles and pairs flying up and down the Congo River on most days in Jan 2005 and Oct 2006. Collected at Banana (Schouteden 1949).

Sterna balaenarum Damara Tern. One flying along the Congo River, 21 Oct.

Columbidae

Treron calva African Green-Pigeon. Flocks of five and eight seen in dry woodland southwest of Soyo, 19 Oct. Collected at Banana (RMCA).

Turtur chalcospilos Emerald-spotted Wood Dove. Heard at all woodland and palm savanna sites, seen foraging on roads through mixed baobab and palm patches and cultivation, every day in May and Oct. At least ten flushed from burning thickets southwest of Soyo, 23 May. New distribution record, not previously known from Zaïre Province (Dean 2000) but the dry open habitat at Soyo is suitable for it, and it has been recorded at Boma and Matadi, DRC, east of Soyo (Schouteden 1950).

Streptopelia semitorquata Red-eyed Dove. Scattered records of single birds flying over Kwanda Base, and calling in palm savanna, May and Oct, but not seen every day. Collected at Banana and Muanda (Schouteden 1950).

S. capicola Cape Turtle-Dove. Seen daily throughout the area, in all types of woodland. Collected at Banana (Schouteden 1950).

Cuculidae

[*Oxylophus jacobinus* Jacobin Cuckoo. Collected at Soyo (Sharpe & Bouvier 1878).]

Chrysococcyx caprius Diderik Cuckoo. One perched on a fallen tree on the east end of Kwanda Base, 18 Oct; heard calling every day in Oct. Collected at Muanda (Schouteden 1950).

Centropus superciliosus White-browed Coucal. Single birds seen and heard in rank swamp grasses daily in May and Oct. Collected at Muanda (RMCA).

C. senegalensis Senegal Coucal. One seen in a swampy patch southwest of Soyo, 19 Oct. May have been heard on other occasions, but call similar to previous species. Collected at Banana and Muanda (Schouteden 1950).

Tytonidae

Tyto alba Barn Owl. One flushed from a roost site in a Lala palm, 17 Oct.

Caprimulgidae

Caprimulgus fossii Square-tailed Nightjar. One hawking flying insects at lights on Kwanda Base 23 May. Collected at Soyo (FMNH), Banana and Muanda (Schouteden 1951).

Apodidae

Cypsiurus parvus African Palm-Swift. Seen every day wherever there were palms throughout the Soyo area. Nests seen on dead Lala palm fronds at a number of places. Birds incubating and feeding chicks at one small colony, 24 May. Much more nesting activity evident in Oct, with birds incubating or feeding young at all sites where there were Lala palms. Collected at Banana (Schouteden 1951).

Apus affinis Little Swift. Seen every day, often in mixed flocks with Palm Swifts, and common at all sites in May and Oct. Collected at Banana (Schouteden 1951).

Coliidae

Colius castanotus Red-backed Mousebird. Two groups, five foraging and six sunning in tall shrubs, 22 May; one or two birds in Lala palms, 23 and 24 May. Seen daily in palm savanna, with clear views of the rufous rump, in Oct. New distribution records, as formerly known to occur north only to about the Bengo river in northern Angola. However, both Traylor (1963) and Dean (2000) overlooked a record of a single bird collected at Banana, date and collector not given (Schouteden 1952).

C. striatus Speckled Mousebird. A group of four (of *C. striatus nigricollis*) sunbathing in a tree near the pump station on the road to Vunda, 18 May; several groups foraging and sunning in tall shrubs in palm savanna near Soyo, 22–24 May. Collected at Banana and Muanda (Schouteden 1952).

Alcedinidae

Halcyon albiventris Brown-hooded Kingfisher. One heard calling in a woodland patch south of Soyo, 23 Oct.

H. senegalensis Woodland Kingfisher. Seen and heard every day throughout the area in May and Oct, in mangrove edges, palm savanna and mixed woodlands. Collected at Banana (Schouteden 1951) and Muanda (RMCA).

H. chelicuti Striped Kingfisher. One calling at Kwanda Base, 17 May. Not seen or heard in Oct. Collected at Soyo (FMNH).

Ispidina picta African Pygmy Kingfisher. A pair on the edge of palm savanna, 21 Oct. Collected at Soyo (FMNH).

Megaceryle maximus African Giant Kingfisher. One calling in woodland on the edge of the Congo River, 23 Oct. Collected at Banana (RMCA) and Muanda (Schouteden 1951).

Ceryle rudis Pied Kingfisher. Common in Jan 2005 (DCLM). Only one record in May, but seen every day in Oct, with several birds regularly seen foraging on the Congo River, and a family of two adults and a juvenile on the edge of the river on 21 Oct. Collected at Banana and Muanda (RMCA).

Meropidae

Merops pusillus Little Bee-eater. A pair perched on a shrub on the river edge, 19 May; a group of seven going to roost in tall shrubs, 22 May; a pair perched on a dead shrub on the edge of a thicket, 23 May. At least seven nest burrows in sandbanks along roads southwest of Soyo, 21 Oct. Collected at Banana (Schouteden 1951) and Muanda (RMCA).

M. variegatus Blue-breasted Bee-eater. One perched in the open on the edge of rank growth southwest of Soyo near the forest patch, 18 May. Several in this general area in Oct. Collected at Banana (Schouteden 1951).

M. bullockoides White-fronted Bee-eater. Present at breeding colonies in sandpits on the edge of Soyo, and at sandpits south of Soyo, 20 and 23 Oct. At least five pairs feeding young at the Soyo colony, 20 Oct. Not recorded away from the nest sites.

Coraciidae

Eurystomus glaucurus Broad-billed Roller. Seen flying over Kwanda Base, and in palm savanna and open baobab woodland southwest of Soyo on four occasions in May. Much more prominent in Oct, particularly on the E end of Kwanda Base, and seen and heard every day. Nests in holes in Lala palms, 20 and 22 Oct. New distribution records: not previously known from Zaïre Province (Dean 2000) but collected at Banana and Muanda (Schouteden 1951).

Bucerotidae

Tockus fasciatus African Pied Hornbill. A group of three, 19 May, and probably the same group flying over palm savanna west of Soyo, 21 May. Not seen in Oct. Collected at Banana (Schouteden 1951) and Muanda (RMCA).

T. alboterminatus Crowned Hornbill. Two in a tall mangrove at 6°16.42'S, 12°31.802'E, 23 May. Not seen in Oct. Traylor (1963) and Dean (2000) overlooked a specimen from Soyo, listed in Schouteden (1951) without details. The closest other records to Soyo are from Vista (5°52'S, 12°17'E) and Matadi in the DRC (Schouteden 1951).

Capitonidae

Pogoniulus bilineatus Yellow-rumped Tinkerbird. One calling from a forest patch southwest of Soyo, 20 Oct.

Indicatoridae

Indicator indicator Greater Honeyguide. One calling from mangroves on the edge of the Congo River, 21 Oct.

Alaudidae

Mirafra sabota Sabota Lark. One in grassland southwest of Soyo, 23 May.

Hirundinidae

Hirundo semirufa Red-breasted Swallow. Pairs seen at Kwanda Base every day in Oct. Not recorded in May. Collected at Banana (Sharpe & Bouvier 1877).

H. senegalensis Mosque Swallow. One hawking insects over short, mowed grass on Kwanda Base, 20 May. Collected at Banana (Schouteden 1955) and Muanda (RMCA).

H. abyssinica Lesser Striped Swallow. Seen every day in May and Oct at all localities in the Soyo area. Several nests seen on houses at Kwanda Base in May and Oct. Collected at Banana (Schouteden 1955).

H. rufigula Red-throated Cliff Swallow. Two at a pond on Kwanda Base, 17 May; two in a mixed flock of Lesser Striped Swallows west of Soyo, 21 May. At least six foraging in the smoke from a grass fire southwest of Soyo, 23 May. Collected at Banana (Schouteden 1955).

H. rustica Barn Swallow. Three flying across Kwanda Base, 23 Oct. Collected at Banana and Muanda (Schouteden 1955).

Motacillidae

Anthus pallidiventris Long-legged Pipit. Seen every day in May and Oct, on mowed or short or recently burnt grass throughout. Collected at Banana and Muanda (RMCA).

Pycnonotidae

Chlorocichla falkensteini Yellow-necked Greenbul. Two seen in small forest patch near Soyo, 22 Oct. Collected at Soyo (FMNH) and Muanda (Schouteden 1954).

Pycnonotus barbatus Common Bulbul. Seen every day in May and Oct throughout the area, in rank growth, palm savanna, thickets and edges of mangroves. Seen eating Wild Date palm fruits *Phoenix reclinata* and fruits of Kanoti Grass *Flagellaria guineensis*. Collected at Banana and Muanda (Schouteden 1954).

[*Nicator vireo* Yellow-throated Nicator. Collected at Soyo (FMNH).]

Turdidae

Cichladusa ruficauda Rufous-tailed Palm-Thrush. Seen every day in palm savanna and around the houses, buildings and open steel-framed sheds on Kwanda Base. Adults carrying food to nests in the warehouses on Kwanda Base, 17 May. Two nests with young, in Lala palms on the E edge of Kwanda Base, 23 Oct. Collected at Banana (Schouteden 1954).

Sylviidae

Cisticola bulliens Bubbling Cisticola. Seen every day, in rank growth on mangrove edges and in tall grasses and edges of thickets in palm savanna throughout the area in May and Oct. Almost certainly breeding in Oct, with calling, displaying males and many interactions between males noted. Collected at Soyo (FMNH), Banana and Muanda (Schouteden 1955).

C. aridulus Desert Cisticola. Heard calling over grassland west and southwest of Soyo every day in May and Oct. Collected at Soyo (FMNH).

Camaroptera brachyura Bleating Warbler. Heard calling from dense woodland on the W edge of Kwanda Base, 23 Oct. Collected at Soyo (FMNH).

[*Sylvietta virens* Green Crombec. Collected at Soyo (FMNH) and Muanda (RMCA).]

Phylloscopus trochilus Willow Warbler. One in a cassava patch southwest of Soyo, 18 Oct.

Sylvia borin Garden Warbler. One foraging in dry palm leaves and shrubs in palm savanna, 23 Oct.

Muscicapidae

Platysteira cyanea Brown-throated Wattle-eye. A pair seen in mangroves near Kwanda Base, 20 May. Collected at Soyo (FMNH) and Muanda (Schouteden 1955).

[*Platysteira albifrons* White-fronted Wattle-eye. Collected at Soyo (FMNH).]

Timaliidae

Turdoides jardineii Arrow-marked Babbler. Two in rank shrubs west of Soyo, 22 May. Not previously known from Zaïre Province (Dean 2000). Distribution (of *T. j. hypostictus*) includes Cabinda and Cuanza Norte (Traylor 1963), but closest specimen records are Boma, DRC (Schouteden 1954) and Calanda, Angola (7°18'S, 15°3'E) (Dean 2000).

Paridae

[*Parus leucomelas* White-winged Black Tit. Collected at Soyo (Sharpe & Bouvier 1877).]

Nectariniidae

Anthreptes gabonicus Brown Sunbird. A pair in mangroves on the S edge of Kwanda Base, 19 May; frequent in mangroves westward along the river, 20 May. Not previously known south of Cabinda (Traylor 1963, Dean 2000), but one specimen collected at Banana (Büttikofer 1888) so not unexpected at Soyo.

Cyanomitra verticalis Green-headed Sunbird. An adult female foraging in the top of a Lala palm at Kwanda Base, 17 Oct. Collected Soyo (FMNH) and Banana (Schouteden 1956).

[*Chalcomitra fuliginosa* Carmelite Sunbird. Collected at Soyo (FMNH), Banana and Muanda (Schouteden 1956).]

Cinnyris bifasciatus Purple-banded Sunbird. A pair in tall shrubs west of Soyo, 19 May; a pair feeding at shrub flowers at Vunda; a pair feeding at a flowering shrub in a cassava patch, 18 May; at least six foraging at and defending flowering creepers southwest of Soyo, 23 May. Seen daily, mostly in pairs, at all sites in Oct. Two recently used nests, another being built and a nest with two eggs found on the edge of Kwanda Base and southwest of Soyo, 19 Oct. A female gathering spider web and building a nest in a small tree on the edge of the old golf course at Kwanda Base, 21 Oct. Collected at Soyo (FMNH), Banana and Muanda (Schouteden 1956).

C. cupreus Copper Sunbird. A female foraging at a flowering *Lantana camara* shrub west of Soyo, 18 May. Collected at Banana (RMCA) and Muanda (Schouteden 1956).

Laniidae

Lanius collaris Fiscal Shrike. A pair near tennis courts on Kwanda Base, 20 and 22 May; one in open grassland southwest of Soyo, 23 May. Heard in palm savanna west of Soyo on four occasions in May and Oct. Collected at Muanda (Schouteden 1956).

Malaconotidae

[*Malaconotus sulfureopectus* Orange-breasted Bush-Shrike. Collected at Soyo (FMNH).]

Laniarius bicolor Swamp Boubou. Seen every day in rank, swampy patches throughout the area in May and Oct. Collected at Banana (Schouteden 1956).

Corvidae

Corvus albus Pied Crow. Seen every day, associated with settlements and disturbances. Roosts of 16 and 30 birds in trees at the E end of Kwanda Base, 21 May. A bird incubating on a nest in a tall Lala palm at the E end of Kwanda Base, 18 Oct; another incubating on a nest in a similar site adjacent to the Base, 23 Oct.

Sturnidae

Lamprotornis nitens Cape Glossy Starling. Seen on four of eight days in mixed woodland, edges of thickets and cultivated lands southwest of Soyo in May. Seen daily in Oct, with pairs flying over Kwanda Base and perched on baobab trees in and around Soyo. Collected at Soyo (Sharpe & Bouvier 1878).

Passeridae

Passer griseus Northern Grey-headed Sparrow. Seen daily around houses and buildings in the town of Soyo and at Kwanda Base, and on the edges of palm savanna on several occasions in May and Oct. Collected at Soyo (FMNH), Banana and Muanda (Schouteden 1958).

P. domesticus House Sparrow. Seen daily, only at buildings in the more industrial parts of Kwanda Base.

Ploceidae

Ploceus pelzelni Slender-billed Weaver. Two records of birds in tangled reed beds and swamp grasses west and southwest of Soyo in May. Not recorded in Oct.

P. subpersonatus Loango Weaver. A male with partial blackish hood seen in reeds south of Kwanda Base, 17 May. Not previously recorded south of the Congo River, but not unexpected given that there is abundant reed habitat in the area. Schouteden (1958), cites a specimen collected between Muanda and Vista, and a Chapin record at Boma, DRC. Another specimen was collected east of Soyo at Matadi, DRC by the Laenen expedition (study skin in ZFMK).

P. nigricollis Black-necked Weaver. Several foraging in tall grasses on the edge of the Kwanda Base, 23 Oct. Collected at Muanda (Schouteden 1958).

P. ocularis Spectacled Weaver. Single birds foraging in rank growth on edges of palm savanna west of Soyo, 21 and 24 May.

P. xanthops Holub's Golden Weaver. Single birds and small groups foraging in rank growth on the river, and large flocks going to roost in palm savanna west of Soyo on several evenings in May. Nesting in reeds in swamp patches near Soyo, 22 Oct.

P. cucullatus Village Weaver. Flocks of *P. cucullatus collaris* seen daily in mangroves on the S edge of Kwanda Base; a very large flock in a cassava patch southwest of Soyo, 18 May. Breeding at Kwanda Base in Oct, with several colonies of > 70 pairs each in introduced palms and *Eucalyptus* trees. Collected at Soyo (FMNH) and Muanda (Schouteden 1958).

Pachyphantes superciliosus Compact Weaver. A male in rank grass on the E end of Kwanda Base, 22 May; a female and juvenile in the same area, 22 Oct. Compact build, heavy bill, mask and greenish back on both sexes unmistakable. Collected at Matadi, DRC (Schouteden 1958).

Estrildidae

Estrilda perreini Grey Waxbill. A pair with a juvenile in tall grass on the edge of the river west of Soyo, 21 May; a group of three foraging in tall grass in the same area, 22 Oct. Collected at Muanda (Schouteden 1958).

E. melpoda Orange-cheeked Waxbill. A pair in tall grass on the edge of palm savanna west of Soyo, 19 May. Seen on three occasions in Oct, once a flock of ten with c. 20 Common Waxbills in tall grass on 22 Oct. Collected at Banana and Muanda (RMCA).

E. astrild Common Waxbill. Flocks in tall grass west of Soyo, 22 and 23 May. Seen daily in that area in Oct, with flocks of up to 30 in tall seeding grasses. Collected at Muanda (Schouteden 1958).

Uraeginthus angolensis Blue Waxbill. Seen every day in May and Oct, in settlements and disturbed patches throughout. Less often in palm savanna and mixed woodlands. A pair building a nest in wire screens on a warehouse on Kwanda Base, 23 May. Foraging with Bronze Mannikins and Pin-tailed Whydahs on short grass patches around houses at Kwanda Base. Collected at Muanda (Schouteden 1958).

Spermestes cucullata Bronze Mannikin. Seen every day around houses and on short grass at Kwanda Base, and in tall grass in palm savanna, edges of thickets and cultivated patches. Flocks up to c. 90, of which usually c. 50% juveniles, foraging on short grass and bare patches in Kwanda Base in May. Far fewer juveniles present in Oct, indicating that breeding peak was later. Collected at Soyo (FMNH), Banana, Muanda (Schouteden 1958).

Viduidae

Vidua macroura Pin-tailed Whydah. Seen every day in most habitats, usually foraging with Bronze Mannikins on seeds of lawn grasses around houses at Kwanda Base. Males in full and partial breeding plumage present in May and Oct. Collected at Banana and Muanda (Schouteden 1958).

Fringillidae

Serinus capistratus Black-faced Canary. A pair in rather atypical habitat of tall shrubs on the edge of palm savanna west of Soyo, 23 May. At least four pairs on the edge of a small forest patch west of Soyo, 22 and 23 Oct. Interactions between males suggested that the birds were breeding, but no nests were found.

[*Emberiza tahapisi* Cinnamon-breasted Bunting. Collected at Soyo (Sharpe & Bouvier 1878), Banana (RMCA) and Muanda (Schouteden 1958).]

Acknowledgments

We are grateful to the management and staff of the Angola LNG Project for the opportunity to visit Soyo and Kwanda Base, and to the staff at Kwanda Base,

particularly Paul Buys, Burt Triegaardt and Brian Cleator for logistics and for organising field trips to key sites for verification of the vegetation map of the area. WRJD thanks Warren Klein for his company on excursions, and Pat Morant and Mike Burns at the CSIR, Stellenbosch, South Africa, for the suggestion to visit the area. We gratefully acknowledge the help of Margaret Sandwith, who provided reference material from the Niven Library at the FitzPatrick Institute. We thank John Bates and Dave Willard at FMNH, who kindly provided details of the Boulton specimens, and Kristof Zyskowski, Peabody Museum of Natural History, for details of specimens. Michel Louette kindly provided a list of specimens in RMCA collected at Banana and Muanda. Information on specimens in BMNH and ZFMK, was collected by WRJD with funding from The Leverhulme Trust, London and the Global Biodiversity Information Facility, Denmark, respectively. The help of Robert Prÿs-Jones and Mark Adams for facilitating data collection at Tring, and Renate van den Elzen for facilitating the visit to Bonn is gratefully acknowledged.

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Appendix 1

Additional species collected north of the Congo River at Banana (B) and Muanda (M), which might be expected to occur in the Soyo area.

Species	Sites	References ¹
<i>Sula capensis</i> Cape Gannet	BM	S (1948)
<i>Egretta ardesiaca</i> Black Heron	B	RMCA
<i>Phoenicopterus minor</i> Lesser Flamingo	B	RMCA
<i>Nettapus auritus</i> African Pygmy Goose	M	S (1948)
<i>Melierax metabates</i> Dark Chanting Goshawk	B	RMCA
<i>Accipiter tachiro</i> African Goshawk	B	RMCA
<i>Francolinus afer</i> Red-necked Francolin	M	S (1949)
<i>Sarothrura pulchra</i> White-spotted Flufftail	B	RMCA
<i>Crex egregia</i> African Crake	B	RMCA
<i>Gallinula angulata</i> Lesser Moorhen	B	RMCA
<i>Recurvirostra avosetta</i> Eurasian Avocet	B	RMCA
<i>Charadrius hiaticula</i> Ringed Plover	B	RMCA
<i>C. pecuarius</i> Kittlitz's Plover	BM	S (1949)
<i>Pluvialis squatarola</i> Grey Plover	B	RMCA
<i>Calidris alba</i> Sanderling	B	RMCA
<i>C. minuta</i> Little Stint	B	S (1949)
<i>C. ferruginea</i> Curlew Sandpiper	B	SB (1876), S (1949)
<i>Tringa nebularia</i> Common Greenshank	BM	S (1949)
<i>Philomachus pugnax</i> Ruff	B	S (1949)
<i>Arenaria interpres</i> Ruddy Turnstone	B	S (1949)
<i>Larus cirrocephalus</i> Grey-headed Gull	B	RMCA
<i>Sterna sandvicensis</i> Sandwich Tern	B	SB (1876), S (1949)
<i>S. hirundo</i> Common Tern	B	S (1949)
<i>S. paradisaea</i> Arctic Tern	BM	RMCA, C (2007)
<i>Chlidonias niger</i> Black Tern	B	SB (1876)
<i>C. leucopterus</i> White-winged Tern	B	RMCA
<i>Centropus grillii</i> Black Coucal	M	S (1950)
<i>Turtur afer</i> Blue-spotted Wood Dove	BM	S (1950)
<i>Oena capensis</i> Namaqua Dove	BM	S (1950)
<i>Tauraco schuettii</i> Black-billed Turaco	B	RMCA
<i>Bubo africanus</i> Spotted Eagle-Owl	M	RMCA

Species	Sites	References ¹
<i>Apus horus</i> Horus Swift	B	SB (1876)
<i>Halcyon malimbica</i> Blue-breasted Kingfisher	B	S (1951)
<i>Corythornis cristata</i> Malachite Kingfisher	B	S (1951)
<i>Alcedo quadribrachys</i> Shining-blue Kingfisher	B	RMCA
<i>Coracias garrulus</i> European Roller	B	RMCA
<i>Merops breweri</i> Black-headed Bee-eater	M	RMCA
<i>M. persicus</i> Blue-cheeked Bee-eater	M	S (1951)
<i>M. malimbicus</i> Rosy Bee-eater	M	S (1951)
<i>Upupa epops</i> Hoopoe	M	S (1951)
<i>Tockus albocristatus</i> White-crested Hornbill	B	S (1951)
<i>Pogoniulus bilineatus</i> Yellow-rumped Tinkerbird	B	S (1952)
<i>Dendropicos fuscescens</i> Cardinal Woodpecker	M	RMCA
<i>Tricholaema hirsuta</i> Hairy-breasted Barbet	M	S (1952)
<i>Mirafra rufocinnamomea</i> Flappet Lark	M	S (1954)
<i>Eremopterix verticalis</i> Grey-backed Sparrow-Lark	M	S (1954)
<i>Hirundo smithii</i> Wire-tailed Swallow	B	S (1955)
<i>H. nigrita</i> White-throated Blue Swallow	B	S (1955)
<i>Riparia cincta</i> Banded Martin	M	S (1955)
<i>Anthus leucophrys</i> Plain-backed Pipit	M	S (1954)
<i>Macronyx croceus</i> Yellow-throated Longclaw	BM	S (1954)
<i>Campephaga flava</i> Black Cuckooshrike	B	SB (1876)
<i>C. petiti</i> Petit's Cuckoo-Shrike	B	S (1954)
<i>Neolestes torquatus</i> Black-collared Bulbul	M	S (1954)
<i>Nicator chloris</i> Western Nicator	M	S (1954)
<i>Myrmecocichla nigra</i> Sooty Chat	M	S (1954)
<i>Turdus pelios</i> African Thrush	BM	S (1954)
<i>Cisticola brachypterus</i> Short-winged Cisticola	BM	S (1955)
<i>C. juncidis</i> Zitting Cisticola	BM	S (1955)
<i>C. natalensis</i> Croaking Cisticola	M	S (1955)
<i>Prinia subflava</i> Tawny-flanked Prinia	BM	S (1955)
<i>Sylvietta virens</i> Green Crombec	M	S (1955)
<i>Apalis flavida</i> Yellow-breasted Apalis	B	S (1955)
<i>Fraseria ocreata</i> Fraser's Forest-Flycatcher	B	S (1955)
<i>Melaenornis pallidus</i> Pale Flycatcher	M	S (1955)
<i>Muscicapa comitata</i> Dusky-blue Flycatcher	M	S (1955)
<i>M. infusata</i> Sooty Flycatcher	M	S (1955)
<i>Terpsiphone rufocinerea</i> Rufous-vented Paradise-Flycatcher	BM	S (1955)
<i>Batis molitor</i> Chinspot Batis	M	RMCA
<i>B. minulla</i> Angola Batis	M	S (1955)
<i>Dyaphorophya castanea</i> Chestnut Wattle-eye	B	S (1955)
<i>Cyanomitra obscura</i> Western Olive Sunbird	B	S (1956)

Species	Sites	References ¹
<i>C. cyanolaema</i> Blue-throated Brown Sunbird	BM	S (1956)
<i>Anabathmis reichenbachii</i> Reichenbach's Sunbird	M	S (1956)
<i>Hedydipna collaris</i> Collared Sunbird	M	S (1956)
<i>Chalcomitra rubescens</i> Green-throated Sunbird	B	S (1956)
<i>C. fuliginosa</i> Carmelite Sunbird	BM	S (1956)
<i>Cinnyris chloropygius</i> Olive-bellied Sunbird	BM	S (1956)
<i>C. superbus</i> Superb Sunbird	M	S (1956)
<i>Tchagra senegala</i> Black-crowned Tchagra	BM	S (1956)
<i>Lamprotornis splendidus</i> Splendid Glossy Starling	M	S (1956)
<i>Cinnyricinclus leucogaster</i> Violet-backed Starling	M	S (1956)
<i>Buphagus africanus</i> Yellow-billed Oxpecker	M	S (1956)
<i>Ploceus nigerrimus</i> Vieillot's Black Weaver	M	S (1958)
<i>Quelea erythrops</i> Red-headed Quelea	M	S (1958)
<i>Euplectes hordeaceus</i> Black-winged Bishop	M	RMCA
<i>E. albonotatus</i> White-winged Widowbird	M	S (1958)
<i>E. macrourus</i> Yellow-mantled Widowbird	M	S (1958)
<i>Pytilia afra</i> Orange-winged Pytilia	M	S (1958)
<i>P. melba</i> Green-winged Pytilia	BM	S (1958)

¹S = Schouteden; SB = Sharpe & Bouvier; C = Clark *et al.*

Appendix 2

Additional species recorded at N'Zeto and Ambriz, south of Soyo in Zaïre Province, which might be expected to occur in the Soyo area.

Species	References
<i>Nettapus auritus</i> African Pygmy Goose	PMNH
<i>Kaupifalco monogrammicus</i> Lizard Buzzard	Hartlaub & Monteiro (1860)
<i>Falco tinnunculus [rupicolus]</i> Common Kestrel	BMNH
<i>Gallinula angulata</i> Lesser Moorhen	BMNH
<i>Eupodotis melanogaster</i> Black-bellied Korhaan	BMNH
<i>Glareola nordmanni</i> Black-winged Pratincole	Sharpe (1869)
<i>Coracias naevia</i> Purple Roller	Sharpe (1869)
<i>C. caudata</i> Lilac-breasted Roller	Sharpe (1869)
<i>C. spatulata</i> Racket-tailed Roller	BMNH
<i>Campethera abingoni</i> Golden-tailed Woodpecker	Sharpe (1869)
<i>Hirundo angolensis</i> Angola Swallow	BMNH
<i>Motacilla aguimp</i> African Pied Wagtail	BMNH
<i>Cisticola juncidis</i> Zitting Cisticola	BMNH

Nouvelles observations ornithologiques en Côte d'Ivoire

par Olivier Lachenaud¹, Henk-Jan Oosterhuis², Bruno Boedts³ & John Gunningham⁴

¹1070 Avenue de Fès, 34080 Montpellier, France. <olivier.lachenaud@laposte.net>

²24 Kap, 1628 GG Hoorn, Pays-Bas

³Banque Africaine de Développement, Immeuble Fitaratra, 9e étage, Ankorondrano, BP 1718, Analakely, Antananarivo 101, Madagascar

⁴5802 Foxtail Court, Ferndale, WA 98248, États-Unis

Reçu 15 avril 2005; revu 17 septembre 2007.

Résumé

Les observations ornithologiques réalisées par les auteurs en Côte d'Ivoire durant la période 1977–2002 sont ici présentées. Les plus remarquables sont la découverte d'une colonie de hérons et cormorans, la deuxième mention ivoirienne du Chevalier bargette *Xenus cinereus* et des extensions d'aire vers le sud pour sept espèces. Beaucoup d'autres espèces rares ont également été observées.

Summary

Recent bird observations in Ivory Coast. Ornithological observations made by the authors in Ivory Coast during the period 1977–2002 are here presented. The most noteworthy are the discovery of a heron and cormorant breeding colony, the second Ivorian record of Terek Sandpiper *Xenus cinereus* and southward range extensions for seven species. Many other rare species have been recorded as well.

Introduction

Si la plupart des espèces composant l'avifaune ivoirienne sont à présent connues, la répartition, le statut et l'abondance d'un grand nombre d'entre elles restent à préciser.

Nous avons tous résidé plusieurs années en Côte d'Ivoire entre 1977 et 2002, et la majorité de nos observations d'oiseaux proviennent des alentours de nos lieux de résidence, Abidjan et Yamoussoukro. Cette dernière localité est mal connue des ornithologues et nous y avons fait d'intéressantes découvertes. Nous avons également pu visiter de nombreux autres sites dont certains sont brièvement présentés ci-dessous. Les coordonnées de tous les sites mentionnés sont présentées dans le Tableau 1.

Réserve d'Abokouamékro. Environ 50 km à l'est de Yamoussoukro. Savane sèche et claire, avec de petits îlots forestiers. Au centre de la réserve se trouve un lac artificiel.

Tableau 1. Coordonnées géographiques des localités mentionnées

	N	W		N	W
Abidjan	5°19'	4°1'	Kafolo	9°35'	4°18'
Abokouamékro (Réserve)	6°50'	5°2'	Katiola	8°31'	5°4'
Adiopodoumé	5°20'	4°7'	Korhogo	9°22'	5°31'
Alépé	5°30'	3°39'	Lamto	6°13'	5°2'
Anguédédou (FC)	5°22'	4°5'	Lieupleu	7°6'	8°7'
Assinie	5°8'	3°15'	Man	7°13'	7°37'
Azagny (PN)	5°10'	4°50'	Marahoué (PN)	6°55'–7°13'	5°55'–6°14'
Banco (PN)	5°22'	4°5'	Mopri (FC)	5°50'	4°55'
Bécédi	5°38'	4°35'	Nimba (Mt)	7°35'	8°25'
Biankouma	7°45'	7°37'	Ouangolodougou	9°56'	5°11'
Bingerville	5°19'	4°1'	San Pedro	4°45'	6°37'
Bouaké	7°41'	5°2'	Sassandra	4°57'	6°8'
Comoé (PN)	8°31'–9°37'	3°5'–4°27'	Séguéla	7°58'	6°44'
Dabou	5°20'	4°23'	Séfonekaha	9°26'	5°11'
Daloa	6°56'	6°28'	Tonkoui (Mt)	7°27'	7°39'
Danané	7°21'	8°10'	Toumodi	6°34'	5°1'
Divo	5°46'	5°22'	Vavoua	7°22'	6°29'
Gagnoa	6°4'	5°55'	Yamoussoukro	6°49'	5°17'
Gouessesso	7°52'	7°40'	Yapo (FC)	5°42'	4°6'
Grand-Bassam	5°05'	3°44'	Yaya (FC)	c. 5°40'	c. 3°32'
Guessabo	6°44'	7°0'			

CAMP (Camp Alpin des Missions Protestantes). A peu près à mi-chemin entre Man et Biankouma. Forêt très dégradée, avec quelques grands arbres çà et là, notamment le long des rivières. Nombreuses plantations de café avec des arbres moyens laissés comme ombrage. Avifaune forestière riche malgré le caractère très dégradé du milieu.

Gouessesso. 10 km à l'ouest de Biankouma, à la limite forêt/savane; comme au CAMP, la forêt y est très dégradée, avec de vieilles plantations de cacao sous ombrage.

Mont Tonkoui. Au nord-ouest de Man, un des plus hauts sommets de la Côte d'Ivoire (1189 ou 1293 m d'altitude selon les cartes). Forêt encore bien conservée notamment près du sommet, qui est occupé par une station de télévision.

Séfonekaha. Petit village situé à 20 km au sud-est de Ferkessédougou, en savane subsoudanienne.

Station CNRA (Centre National de Recherche Agronomique) de Divo. Station de recherche située à 20 km au sud-est de la ville de Divo, couvrant 3600 ha dont 2000–2500 de forêt, le reste occupé par des plantations. Nous avons signalé précédemment (Lachenaud 2004) la présence sur ce site de l'Echenilleur caronculé *Lobotos lobatus*,

espèce Vulnérable (Stattersfield & Capper 2000). Le site, encore très peu prospecté (trois courtes visites seulement), paraît donc intéressant.

La région de Man (CAMP, Gouessesso, Mont Tonkoui), qui reste assez peu connue sur le plan ornithologique, s'est avérée particulièrement intéressante; plusieurs espèces forestières rares (*Ploceus preussi*, *Campephaga quiscalina*, *Hyliota violacea*) s'y sont avérées communes, même dans les plantations de café et de cacao sous ombrage.

Les observations réalisées dans la région de Sassandra, ainsi que dans le PN du Banco et la Forêt classée de l'Anguédedou, ont déjà fait l'objet de publications séparées (Lachenaud 2006a, 2006b).

Les observations citées ici concernent des espèces rarement observées en Côte d'Ivoire, des extensions de répartition, de nouvelles données sur la nidification, ou encore des additions à l'avifaune de sites protégés (PN de la Marahoué, Réserve de Lamto). La nomenclature suit celle de Borrow & Demey (2001). Les abréviations CI, PN et FC signifient respectivement Côte d'Ivoire, Parc National et Forêt Classée.

Observations

Phalacrocoracidae

Phalacrocorax africanus Cormoran africain. Nicheur à Grand-Bassam (Tableau 2); nids en mai, jeunes en juin 2002. Premier cas de nidification de l'espèce en CI.

Ardeidae

Ixobrychus sturmii Blongios de Stürm. Deux oiseaux vus régulièrement dans un marais à Abidjan (Riviera) de nov 1998 à avr 1999, abandonnèrent le site à la suite de défrichements. Rare en CI (Thiollay 1985, Demey & Fishpool 1991).

Nycticorax nycticorax Bihoreau gris. Nicheur à Grand-Bassam (Tableau 2). L'espèce étant encore abondante en mai-juin à Abidjan, la population nicheuse est certainement bien plus importante que ne le suggère Thiollay (1985). Dans l'intérieur, où l'espèce est très locale (Thiollay 1985), observé à Bouaké (deux oiseaux, 4 oct 2000) et aux lacs de Yamoussoukro (assez commun pendant la saison des pluies; un juvénile le 9 fév 2002).

Bubulcus ibis Héron garde-boeufs. Nicheur abondant à Grand-Bassam (Tableau 2); nids en mai, jeunes en juin 2002. Premier cas de nidification en CI (cf. Thiollay 1985).

Ardeola ralloides Crabier chevelu. Nicheur à Grand-Bassam (Tableau 2); nids en mai, jeunes en juin 2002. Premier cas de nidification en CI (cf. Thiollay 1985).

Egretta intermedia Aigrette intermédiaire. Nicheuse à Grand-Bassam (Tableau 2); nids en mai, jeunes en juin 2002. Premier cas de nidification en CI. Un oiseau sur le Bandama à Lamto, 2 mai 2002; nouveau pour le site (cf. Thiollay 1972).

Ardea melanocephala Héron mélanocéphale. Un oiseau à Sassandra, au bord du fleuve Sassandra, déc 1977. Nouveau pour la région (cf. Lachenaud 2006a).

Phalacrocoracidae et Ardeidae

Une colonie (Tableau 2) était située au niveau du pont sur le fleuve Comoé, à la sortie de Grand-Bassam en direction d’Assinie. La héronnière est présente à cet endroit depuis 1998 au moins; le fait qu’elle n’ait pas été signalée par les nombreux ornithologues ayant visité la région (notamment Thiollay 1985, Demey & Fishpool 1991) suggère cependant que son installation est récente. En 2000, elle occupait deux îlots situés de part et d’autre du pont sur la Comoé. En 2002, seul l’îlot situé à gauche du pont (en venant d’Abidjan) était occupé; l’îlot à droite, qui abritait le plus grand nombre d’oiseaux (dont la totalité des *Nycticorax*) en 2000, est resté inoccupé, sans doute à cause des perturbations humaines. Une diminution de l’effectif global par rapport à 2000 était nettement visible. En 2002, les espèces indiquées construisaient leurs nids en mai et élevaient des jeunes en juin, à l’exception du *Nycticorax* dont la nidification semble plus tardive (nids observés en juillet 2000; en juin 2002, de nombreux individus transportaient des branchages vers un autre site en bordure du fleuve). Il est probable que d’autres colonies de hérons restent à découvrir dans la région côtière, notamment dans le sud-ouest, qui reste mal connu des ornithologues.

Tableau 2. Effectifs estimés (nombre de couples) d’une colonie de hérons et cormorans à Grand-Bassam (BB).

	10 juillet 2000	2 juin 2002
<i>Phalacrocorax africanus</i> Cormoran africain	10	8
<i>Nycticorax nycticorax</i> Héron bihoreau	20	12*
<i>Ardeola ralloides</i> Héron crabier	15	3
<i>Bubulcus ibis</i> Héron garde-boeufs	80	30
<i>Egretta intermedia</i> Aigrette intermédiaire	20	18
Effectif total	145	71

*Nombre possible: les nids n’étaient pas encore visibles au moment de l’observation.

Threskiornithidae

Plegadis falcinellus Ibis falcinelle. Deux oiseaux le 9 fév 2002 et trois le 10 fév dans un dortoir de *Bubulcus ibis* aux lacs de Yamoussoukro. Migrateur rare (Thiollay 1985, Demey & Fishpool 1991); première observation dans le centre de la CI.

Anatidae

Dendrocygna viduata Dendrocygne veuf. Régulier aux lacs de Yamoussoukro, jan–avr; une observation en août. Thiollay (1985) n’évoque pas sa présence dans le centre de la CI.

Accipitridae

Accipiter badius Epervier shikra. Nid à Abidjan (Riviera), dans la fourche d’un *Ficus benjamina*, mars 2000; nourrissage d’un immature sur le même site, juin 2000.

Second cas de nidification dans la région côtière. Thiollay (1985) ne signalait pas l'espèce de la côte; aujourd'hui bien établie autour d'Abidjan (Rainey & Lachenaud 2002).

Accipiter ovampensis Épervier de l'Ovampo. Un oiseau vu à plusieurs reprises au CAMP, août 1990. Nouveau site (cf. Thiollay 1985, Demey & Fishpool 1991).

Micronisus gabar Autour gabar. Un oiseau dans le jardin d'un hôtel à Daloa, fév 1998; deux à Lamto, 7 fév 1999; un à Séfonékaha, 18 déc 2001. Une seule observation antérieure au sud de Bouaké, à Lamto (Thiollay 1985).

Hieraaetus spilogaster Aigle fascié. Un oiseau, observé longuement et de près, en savane de Lamto, 7 mai 2000. Distingué de l'Aigle d'Ayres *H. ayresi* par sa plus grande taille, le dessous à stries nettement moins denses, l'absence de crête et surtout la tache blanche au niveau des rémiges primaires, très visible en vol. Rare en CI, n'avait pas été observé au sud de Katiola (Thiollay 1985). La région de Lamto étant bien connue, cet oiseau était probablement un égaré.

Falconidae

Falco subbuteo Faucon hobereau. Un immature à Abidjan, 23 sep 2000. Migrateur peu fréquent (Thiollay 1985, Demey & Fishpool 1991).

Phasianidae

Coturnix delegorguei Caille arlequine. Un mâle le 31 mar et un couple le 26 mai 2002 à Yamoussoukro, dans un terrain à herbes rases où la Caille bleue *C. chinensis* a également été observée. Migratrice rare (Thiollay 1985, Demey & Fishpool 1991).

Ptilopachus petrosus Poule de roche. Une bande d'environ huit oiseaux sur un affleurement latéritique à quelques km au nord de Séguéla, en 1978. Observation la plus méridionale en CI.

Glareolidae

C. temminckii Courvite de Temminck. Plusieurs à Yamoussoukro, 23 fév 2002. Visiteur rare au sud de 8°N (Thiollay 1985).

Glareola pratincola Glaréole à collier. Colonie de c. 100 à Yamoussoukro, dans un terrain à herbes rases, présents fév–oct au moins, mais absents du site en déc. Parades et accouplement observés, 31 mar 2002; un juvénile, 28 juil 2002. Deuxième site de nidification connu en CI (cf. Demey & Fishpool 1991).

Haematopodidae

Haematopus ostralegus Huîtrier pie. Un oiseau à Assinie en compagnie de Barges rousses *Limosa lapponica*, 21 août 2001. Huitième observation en CI, la première en été (Thiollay 1985, Demey & Fishpool 1991).

Charadriidae

Vanellus spinosus Vanneau à éperons. Un oiseau à Lamto, sur les rochers du fleuve Bandama, 2 mai 2002. Nouvelle localité (cf. Thiollay 1972).

Scolopacidae

Tringa stagnatilis Chevalier stagnatile. Un sur la lagune d'Abidjan, oct 2000, et un à Grand-Bassam, 15 sep 2002, tous deux en compagnie d'autres limicoles. Thiollay (1985) le signale de nov–mai seulement.

Xenus cinereus Chevalier bargette. Un oiseau au bord de la lagune à Grand-Bassam, 5 oct 2001. Le bord postérieur blanc des ailes, l'absence de tache blanche au croupion, la couleur gris clair du plumage et le bec jaune légèrement recourbé vers le haut ont permis une identification aisée (BB). Seconde observation en CI, la précédente à Abidjan, déc (Thiollay 1985).

Philomachus pugnax Combattant varié. Un oiseau à Guessabo, sur le lac de Buyo, 28 avr 2001. Quatrième observation dans l'intérieur (Thiollay 1985, Walsh 1986).

Rhynchopidae

Rhynchops flavirostris Bec-en-ciseaux d'Afrique. Un oiseau à Assinie en oct et déc 2000, en compagnie de nombreuses sternes. Déjà observé à Assinie (Demey & Fishpool 1991, N. Armandy com. pers.); rare en CI (Thiollay 1985, Demey & Fishpool 1991).

Columbidae

Columba guinea Pigeon roussard. Plusieurs observations en périphérie nord-est d'Abidjan (quartier Riviera): groupes de 5–15, sep–oct 1999 et juin 2000; un oiseau, mars 2002. Typique par sa grande taille et sa coloration: dessus châtain vif, tête et dessous gris-bleu, croupion pâle, ailes tachetées de blanc, cou strié, caroncule rouge autour de l'oeil. Ces observations, 600 km au sud de l'aire connue (Thiollay 1985) sont d'autant plus étonnantes que l'oiseau n'est pas habituellement détenu en captivité; l'hypothèse d'échappés semble donc peu probable.

Streptopelia vinacea Tourterelle vineuse. Un oiseau à 2 km à l'ouest de Vavoua, août 1990. Deux en savane sèche dans la réserve d'Abokouamékro, 29 déc 2001. Premières observations au sud de Bouaké (Thiollay 1985).

Psittacidae

Poicephalus gulielmi Perroquet à calotte rouge. Observé à Divo et sur la station CNRA au sud-est de la ville où il est abondant. Nouveau site pour cette espèce habituellement rare (Thiollay 1985, Holyoak & Seddon 1990, Demey & Fishpool 1991, Gartshore *et al.* 1995, Waltert *et al.* 1999).

Cuculidae

Oxylophus jacobinus Coucou jacobin. Un oiseau à Danané, 24 fév 2000. Cinq observations en CI dont quatre dans l'extrême nord (Thiollay 1985, Demey & Fishpool 1991).

Caprimulgidae

Caprimulgus tristigma Engoulevent pointillé. Un oiseau sur une colline rocheuse près du CAMP, 3 juil 2002. Nouveau site (cf. Thiollay 1985, Rainey & Lachenaud 2002).

Apodidae

Telacanthura melanopygia Martinet de Chapin. Un oiseau en vol au-dessus de la station CNRA au sud-est de Divo, 31 oct 1999. Nouveau site.

Tachymarptis aequatorialis Martinet marbré. Un oiseau survolant un petit marécage près de Férékessédougou, août 1990. Rare en CI; nouvelle localité.

Lybiidae

Lybius bidentatus Barbican à bec denté. Un oiseau à Sassandra, déc 1977. Facilement distingué de *L. dubius* (seule espèce ivoirienne susceptible de confusion) par la

poitrine entièrement rouge et le bec blanchâtre. Première observation sur la côte; non signalé au sud de Lamto (Thiollay 1985).

L. dubius Barbican à poitrine rouge. Fréquent à Yamoussoukro, où *L. bidentatus* est également présent, mais plus rare. Deuxième localité au sud de Bouaké: connu plus au sud à Toumodi (Thiollay 1985).

Pittidae

Pitta angolensis Brève d'Angola. Un oiseau capturé par un chasseur sur la station CNRA de Divo, 16 jan 1988 (P. Lachenaud com. pers.). Nouveau site (cf. Thiollay 1985, Demey & Fishpool 1991, Gartshore *et al.* 1995, Waltert *et al.* 1999).

Alaudidae

Eremopteryx leucotis Moinelette à oreillons blancs. Un mâle sur un bowal (plaine latéritique à végétation rase) dans le nord du PN de la Comoé, à quelques kilomètres au sud de Kafolo, 26 déc 2000. Rare en CI (Thiollay 1985, Walsh 1986, Demey & Fishpool 1991); déjà observée dans le sud du parc (Salewski 1997).

Hirundinidae

Riparia riparia Hirondelle de rivage. Une petite bande à Ouangolodougou, août 1982. Observation la plus précoce pour ce migrateur paléarctique peu commun; signalé précédemment oct–avr (Thiollay 1985, Demey & Fishpool 1991).

Hirundo aethiopica Hirondelle d'Ethiopie. Découverte dans le sud-est du pays par Demey & Fishpool (1991), aujourd'hui abondante toute l'année à Abidjan. Egalement commune, au moins localement, dans la moitié ouest du pays, où elle n'était pas jusqu'à présent signalée: Sassandra (Lachenaud 2006a), Gagnoa (fév, mars, juil), Man (nombreux oiseaux, avr–mai 2001). Son expansion vers l'ouest (Grimes 1987, Demey & Fishpool 1991) semble donc se poursuivre; pas signalée au Libéria par Gatter (1997).

Delichon urbicum Hirondelle de fenêtre. Une au campement du PN de la Marahoué, 18 avr 2000 et une à Man, 1 mai 2001, en compagnie d'autres hirondelles. Migratrice assez rare (Thiollay 1985, Demey & Fishpool 1991).

Campephagidae

Campephaga quiscalina Echenilleur pourpré. Un mâle en forêt très dégradée à Gouessesso, 25 fév 2000; commun dans des plantations de café et de cacao sous ombrage au CAMP entre Man et Biankouma, toujours observé en couples dans les rondes d'insectivores. Nouvelles localités.

Pycnonotidae

Andropadus ansorgei Bulbul d'Ansorge. Deux oiseaux se nourrissant des fruits d'un *Musanga* en compagnie d'un Bulbul à bec grêle *A. gracilirostris*, en FC de la Yaya au nord d'Alépé, 27 jan 2002. Nouveau site; découvert récemment en CI (Demey & Fishpool 1991) mais y semble largement répandu, du moins dans le sud (Gartshore *et al.* 1995, Waltert *et al.* 1999, Rainey & Lachenaud 2002, Lachenaud 2006b).

Turdidae

Cossypha cyanocampter Cossyphe à ailes bleues. Un dans une plantation de café sous forêt très dégradée au CAMP, 4 juil 2002. Nouvelle localité; rare en CI, peu d'observations récentes (Thiollay 1985, Gartshore *et al.* 1995).

Sylviidae

[*Acrocephalus rufescens* Rousserolle des cannes. Des *Acrocephalus* de grande taille, produisant un chant identique à celui de cette espèce sur les disques de Chappuis (2000) ont été observés et entendus à plusieurs reprises aux lacs de Yamoussoukro pendant toute l'année (y compris en juil-août). La Rousserolle turdoïde *A. arundinaceus*, seule espèce de taille comparable, a un chant nettement différent et n'est présente en Afrique de l'Ouest que de sep à mai (Borrow & Demey 2001). Néanmoins, l'obtention d'enregistrements serait souhaitable pour confirmer la présence de cette espèce en CI. Thiollay (1985) signale une observation possible sans indication de lieu; citée du Mont Nimba (Yaokokore-Beibro 1997) et de la FC de la Bossématié (Yaokokore-Beibro & Ellenberg 2000) mais aucun détail ne vient appuyer ces observations. Connue du Ghana (Grimes 1987).]

Hippolais pallida Hypolaïs pâle. Deux oiseaux le 25 nov 1999, deux le 14 janv 2000 et un en nov 2000, tous sur le même site à Abidjan (Riviera), exploraient le feuillage de l'arbre introduit *Terminalia mantaly*. Un à Vavoua, janv 1978. Ces observations semblent confirmer sa régularité en CI (Demey & Fishpool 1991).

Sylvia borin Fauvette des jardins. Un oiseau dans un jardin à Sassandra, juil 1990. Nouveau pour la région (cf. Lachenaud 2006a).

Hyliota violacea Hyliote à dos violet. Commun au CAMP en forêt très dégradée, en couples ou groupes de 2–3 couples, accompagnant les rondes d'insectivores. Nouvelle localité.

Muscicapidae

Myioparus plumbeus Gobemouche mésange. Un oiseau en forêt dégradée à Bécédi, mai 1983. Rare dans le sud du pays (cf. Thiollay 1985, Demey & Fishpool 1991).

Platysteiridae

Bias musicus Bias musicien. Répandu dans la zone forestière, observé à Gaoulou près de Sassandra (Lachenaud 2006a), en FC de l'Anguédédou (Lachenaud 2006b), à Abidjan, Bingerville, Dabou, Gagnoa, Divo (abondant sur la station CNRA, groupes de 20–30), Vavoua, et au CAMP. Le faible nombre d'observations obtenues par Demey & Fishpool (1991) par rapport à Thiollay (1985) ne semble donc pas refléter un réel déclin de l'espèce, qui par ailleurs est nettement favorisée par les défrichements.

Timaliidae

Turdoides reinwardti Cratérope à tête noire. Observé à Séfonekaha, mars, déc. Nouvelle localité; plus fréquent dans les savanes sud-guinéennes (Thiollay 1985) que dans le nord (Demey & Fishpool 1991).

Phyllanthus atripennis Phyllanthe capucin. Un petit groupe à Sassandra, juil 1990. Deuxième localité connue sur la côte (cf. Thiollay 1985).

Nectariniidae

Anabathmis reichenbachii Soui-manga de Reichenbach. Régulier à Sassandra (Lachenaud 2006a); un oiseau à San Pedro dans un jardin d'hôtel, attiré par les fleurs d'*Azadirachta indica*, 3 juin 2001. Premières observations en CI à l'ouest d'Azagny (Eccles 1985, Demey & Fishpool 1991); l'espèce existe, encore plus à l'ouest, sur la côte libérienne (Gatter 1997).

Cyanomitra verticalis Soui-manga à tête verte. Un oiseau en savane boisée dans le PN de la Marahoué, 30 mars 2002. Nouveau site (cf. Christy & Schulenberg 1999).

C. cyanolaema Soui-manga à gorge bleue. Fréquent au CAMP, en forêt de bord de rivière. Non signalé en CI au nord de Daloa (Thiollay 1985), bien qu'il soit répandu au Libéria jusque dans l'extrême nord (Gatter 1997).

Sturnidae

Poeoptera lugubris Rufipenne à queue étroite. Un oiseau en FC de Mopri, 1 nov 1999; non mentionné de ce site par Gartshore *et al.* (1995).

Onychognathus fulgidus Rufipenne de forêt. Observé à Abidjan (trois en vol au-dessus du golf, 13 mai 1998), N'Douci (un, 5 déc 1999) et au CAMP (c. 10, le 1 juil 2001). Nouvelles localités.

Lamprotornis splendidus Choucador splendide. Observé à Yamoussoukro (fréquent) et dans le PN d'Abokouamékro (un en savane sèche, 29 déc 2001). Nouveaux sites pour cette espèce surtout côtière; signalé précédemment dans l'intérieur (Thiollay 1972, Rainey & Lachenaud 2002).

L. caudatus Choucador à longue queue. Dans le PN de la Comoé: deux au confluent Comoé-Kongo dans le sud du parc (8°48'N, 3°46'W), dans une plaine très ouverte avec des buissons de *Dichrostachys cinerea*, 20 oct 1995 (V. Salewski com. pers.); deux en limite nord du parc à l'ouest de Kafolo, 26 déc 2000. Quatre au barrage de Sambakaha, près de Séfonékaha, 19 déc 2001. Quatre observations précédentes en CI (Thiollay 1985).

Ploceidae

Ploceus preussi Tisserin de Preuss. Deux à Lieupleu (26 km au sud-ouest de Danané), explorant les fougères épiphytes *Platynerium* à 20–25 m de haut dans les arbres d'ombrage d'une plantation de cacao, 24 fév 2000. Fréquent au CAMP en forêt très dégradée; souvent noté dans les rondes d'insectivores. Nouveaux sites (Thiollay 1985, Demey & Fishpool 1991, Gartshore *et al* 1995, Waltert *et al* 1999).

Estrildidae

Nigrita fusconotus Nigrette à ventre blanc. Commun à Vavoua, 1977–9. Observé et entendu à plusieurs reprises en forêt très dégradée au CAMP. Nouvelles localités.

Estrilda troglodytes Astrild cendré. Un à Abidjan (Riviera), en compagnie d'autres estrildidés, 19 déc 1998. Première observation sur la côte depuis 1984 (Demey & Fishpool 1991). Deux à Fakaha, au sud de Korhogo, 19 avr 1999; nouveau site.

Lagonosticta rubricata Amarante foncé. Régulier dans les champs et les broussailles autour de Yamoussoukro, toute l'année mais plus fréquent en saison sèche. Seulement au nord de 8°N d'après Thiollay (1985); récemment signalé plus au sud dans le PN de la Marahoué (Rainey & Lachenaud 2002) et à Lamto (Salewski 1999).

Amandava subflava Bengali zébré. Un petit groupe au bord de la rivière FéréDougouba, près de la frontière avec la Guinée, août 1982. Troisième localité connue en Côte d'Ivoire, et la plus méridionale.

Lonchura fringilloides Capucin pie. Deux observations en limite sud du PN de la Marahoué: un oiseau, 17 avr 2000; un petit groupe, 30 mar 2002. Nouveau site (cf. Christy & Schulenberg 1999)

Viduidae

Vidua chalybeata Combassou du Sénégal. Noté à Vavoua, août 1990. Un mâle vu régulièrement à Yamoussoukro en compagnie de son espèce hôte, l'Amarante du Sénégal *Lagonosticta senegala*. Observations les plus méridionales en CI (cf. Payne 1982).

Conclusion

Sept espèces ont été observées au sud de leur aire connue (voir Salewski *et al.* 2001): *Hieraaetus spilogaster*, *Ptilopachus petrosus*, *Columba guinea*, *Streptopelia vinacea*, *Lybius bidentatus*, *Amandava subflava* et *Vidua chalybeata*. Dans le cas de *Columba guinea*, il s'agit vraisemblablement d'une extension récente: l'espèce est trop remarquable pour avoir pu échapper aux nombreux ornithologues ayant visité la région d'Abidjan. A l'exception d'*Hieraaetus spilogaster* qui pourrait être un visiteur accidentel, les autres espèces ont été découvertes dans des localités mal prospectées, il n'est donc pas possible de déterminer si leur présence y est récente.

La nidification de quatre espèces, *Phalacrocorax africanus*, *Ardeola ralloides*, *Bubulcus ibis* et *Egretta intermedia*, est signalée pour la première fois dans le pays.

Remerciements

Nous remercions Nathalie Armandy, Philippe Lachenaud et Volker Salewski pour nous avoir confié certaines de leurs observations, Ron Demey et Lincoln Fishpool qui ont relu l'article, ainsi que Nik Borrow, Robert Dowsett et Françoise Dowsett-Lemaire pour leurs commentaires éclairés.

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The avifauna of southeast Niger

by Flemming Pagh Jensen, Kim Diget Christensen & Bo Svenning Petersen

Orbicon, Ringstedvej 20, DK-4000 Roskilde, Denmark. <fpj@orbicon.dk>

Received 27 February 2007; revised 17 December 2007.

Summary

A field survey of birds associated with the open habitats of Sahelian SE Niger was carried out in the rainy seasons of 2002, 2003 and 2005, using line transect counts in grassland and farmland plus observations in other habitats, in particular wetlands. In total 250 species are now known from the area. A high density of grasshoppers at the end of the rains is an annual phenomenon in SE Niger. We argue that the large numbers of Cattle Egrets *Bubulcus ibis*, Abdim's Storks *Ciconia abdimii*, Grasshopper Buzzards *Butastur rufipennis*, Abyssinian Rollers *Coracias abyssinicus* and African Grey Hornbills *Tockus nasutus*, observed at the end of the rains, had migrated northwards after breeding to feed on them. Compared to the 1970s, vultures, Bateleur *Terathopius ecaudatus* and Marabou Stork *Leptoptilos crumeniferus* appear to have declined dramatically and the Secretary Bird *Sagittarius serpentarius* has disappeared. A new International Bird Area (IBA) is proposed, the "Diffa-Kinzindi grassland and wetlands". Within it have been recorded six species of global conservation concern (Rüppell's Griffon Vulture *Gyps rueppellii*, Beaudouin's Snake Eagle *Circaetus beaudouini*, Pallid Harrier *Circus macrourus*, Lesser Kestrel *Falco naumanni*, Nubian Bustard *Neotis nuba* and Black-tailed Godwit *Limosa limosa*), 11 out of 16 Sahel biome species, and regularly more than 20,000 waterbirds (Cattle Egrets and Abdim's Storks).

Résumé

L'avifaune du Sud-Ouest du Niger. Une étude de terrain sur les oiseaux associés aux habitats ouverts dans le SE sahélien du Niger a été réalisée pendant les saisons des pluies 2002, 2003 et 2005. L'étude a comporté des comptages d'oiseaux sur des transects dans des zones herbeuses et cultivées mais des observations dans d'autres habitats ont aussi été faites, en particulier dans les zones humides. Au total, 250 espèces ont maintenant été identifiées dans la région. Une densité élevée de sauterelles en fin de saison des pluies est un phénomène annuel au SE du Niger. Nous expliquons que le grand nombre des Hérons garde-boeufs *Bubulcus ibis*, des Cigognes d'Abdim *Ciconia abdimii*, des Buses des sauterelles *Butastur rufipennis*, des Rolliers d'Abyssinie *Coracias*

abyssinicus et des Petits Calaos à bec noir *Tockus nasutus* observés à la fin des pluies migrent ensuite vers le nord après la reproduction afin de s'en nourrir. En comparaison avec les années 1970, les vautours, les Bateleurs *Terathopius ecaudatus* et les Marabouts *Leptoptilos crumeniferus* apparaissent en dramatique déclin et le Messenger serpenteaire *Sagittarius serpentarius* a disparu. Une nouvelle zone importante pour la conservation des oiseaux (International Bird Area IBA) au SE du Niger est proposée, les "zones herbeuses et humides de Diffa-Kinzindi". A l'intérieur de cette zone on a observé six espèces dont l'état de conservation est préoccupant au plan global (Vautour de Rüppell *Gyps rueppellii*, Circaète de Beaudouin *Circaetus beaudouini*, Busard pâle *Circus macrourus*, Faucon crécerellette *Falco naumanni*, Outarde de Nubie *Neotis nuba* et Barge à queue noire *Limosa limosa*), 11 sur 16 espèces du biome Sahel et la présence régulière de plus de 20 000 oiseaux aquatiques (Hérons garde-boeufs et Cigognes d'Abdim).

Introduction

Very little has been published on the birds of southeast Niger. The observations summarized by Giraudoux *et al.* (1988) were mainly from the 1970s, with a few from the 1920s by Buchanan (Hartert 1921, Bates 1933) and from the 1940s by Rousselot (1947). We have not been able to trace any subsequent published records from this part of Niger. In January 1994 and 1995 W. Mullié visited SE Niger in connection with the Africa Waterbird Census. His unpublished records are stored in the Niger Bird Database (NiBDaB), and are also included in this account on the SE Niger birds.

During the rainy seasons of 2002, 2003 and 2005 we studied the birds in SE Niger, with the aims of assessing the extent to which birds control grasshopper populations and how human grasshopper control may affect birds. From our base in Diffa we mainly focused on birds associated with grassland and farmland but, on an *ad hoc* basis, we also recorded birds associated with other habitats, in particular wetlands.

Study area

Our study area (Fig. 1) lies within the Sahel zone and corresponds to "Zone écologique 4" of Giraudoux *et al.* (1988). This part of Niger has a single rainy season from late May to early October with an average annual precipitation of *c.* 340 mm. The natural vegetation is mostly grassland with scattered trees, in particular *Acacia* spp. and *Balanites aegyptiaca*. During the rainy season, many isolated wetlands form across the grassland, some of which hold water for a few months after the end of the rainy season. To the north and west, the grassland is bordered by huge tracts of sand dunes, including the Désert du Tal, with no or only a thin cover of desert grass and shrub-land. The eastern

border follows the former shore of the now dry northern basin of Lake Chad, where the vegetation is at present mainly Mesquite *Prosopis juliflora*, an introduced American tree (Mulli   *et al.* 1995). The Komadougou Yob   river forms the southern boundary of our study area, and is the border with Nigeria. The vegetation is denser along the river and is often flooded during the height of the rainy season. Small-scale rice cultivation and irrigated fields with vegetables (especially sweet pepper) are found close to the river, in particular near Diffa. In a belt extending *c.* 5 km away from the river the grassland has been cultivated in many places to grow millet and sorghum. Ma  n  -Soroa, Diffa and Nguigmi are the only towns and most villages are found along the river and the former shore of L. Chad. Fulani pastoralists with herds of cattle and goats utilise most of the grassland during the rainy season and some months after. During the dry season most herders move their livestock to areas close to the river or into Nigeria.

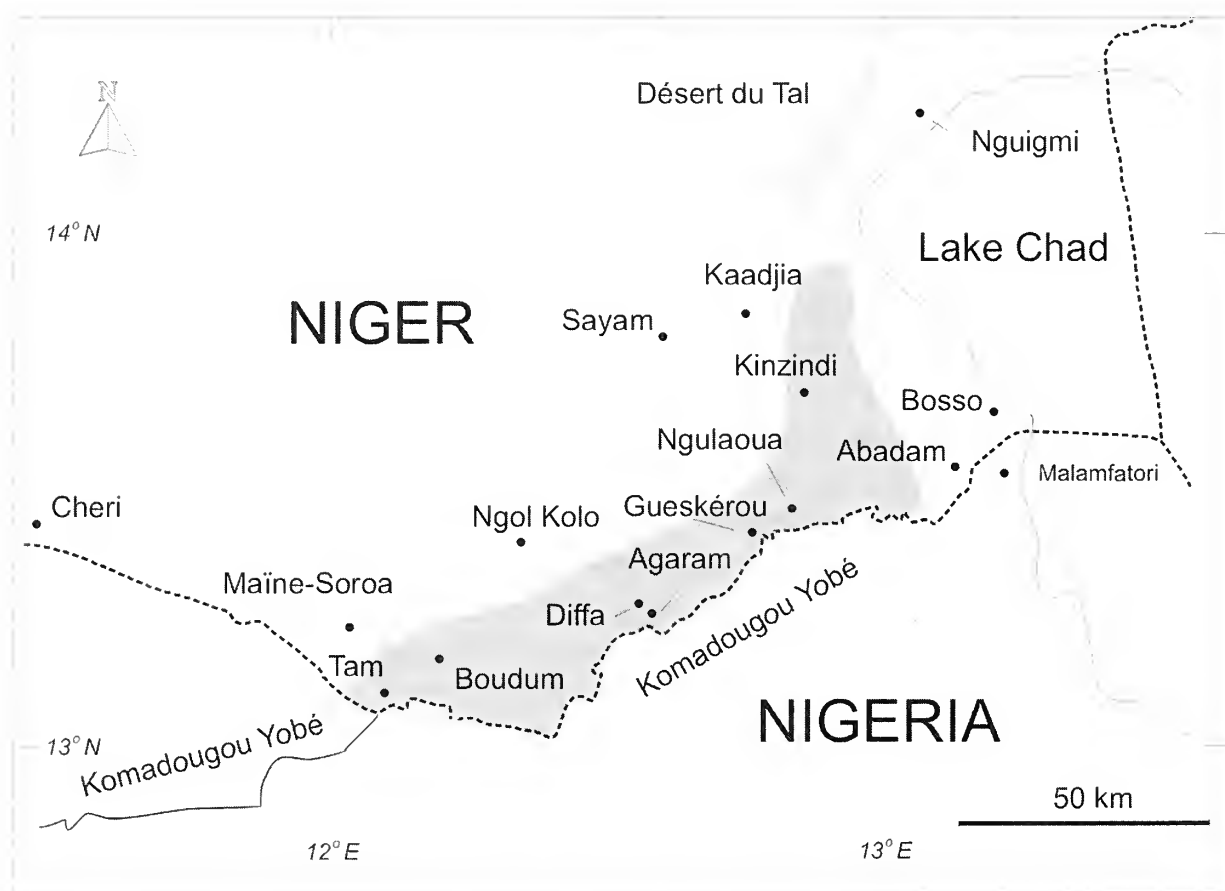


Figure 1. SE Niger with localities mentioned in the text. The dark shaded area shows the main feeding area of Abdim's Storks in Aug–Oct and corresponds to a proposed IBA.

While thick layers of wind-deposited sand cover most of the Sahel, the grassland in SE Niger is mainly on a clayey plain, with extensive layers of sand only to the north and west. This provides particularly favourable breeding habitat for

grasshoppers, most notably the Senegalese Grasshopper *Oedaleus senegalensis*. In July to early August this species reaches very high numbers in SE Niger. In August–September, Senegalese Grasshoppers that have hatched further north in Niger move south as the vegetation dries out, and reach SE Niger in huge numbers in late September and October, bringing the density of grasshoppers up to 10–30 per m², and locally even higher (Z. Ouambama pers. comm.). Unlike locusts, Senegal Grasshoppers have been recorded in high densities in the grassland of SE Niger every year since the mid-1990s when grasshopper studies were initiated there (Z. Ouambama pers. comm.).

Methods

Observations were made near Diffa, along the Komadougou Yobé and at various temporary wetlands across the grassland area from 30 Jul to 2 Aug and 23–27 Sep 2002, 19–23 Aug and 23 Sep to 1 Oct 2003, and 22 Sep to 7 Oct 2005. In 2003 we also made excursions through the grassland to Ngol Kolo and Nguigmi. In 2005 we visited Ngol Kolo, Sayam, Kinzindi, Nguigmi and the Désert du Tal as well as Bosso on the former shore of L. Chad.

Bird counts were carried out on line transects in the grassland and farmland mosaic in the last part of the rainy season, 22–26 Sep 2003 and 23–27 Sep 2005. The starting point for the counts was the road connecting Maïné-Soroa, Diffa and Nguigmi. The counts were carried out with two observers, each counting four line-transect sections of 50 min., corresponding to c. 1000 m. Based on these observations, density (number per km²) was estimated for each bird species. For a more comprehensive account of the method and data analyses, see Petersen *et al.* (2007).

For the species recorded in 2002–5 the following abundance assessment is used (from Morel & Tye 1995): VA = Very abundant >100 may be seen or heard in suitable habitat per day; A = Abundant (11–100 may be seen or heard in suitable habitat per day; C = Common (1–10 may be seen or heard in suitable habitat per day), F = Frequent (often seen or heard but not every day); U = Uncommon (few records only); for rarer species we give details of all records. An abundance assessment assigned to the period “Aug–Oct 2002–5” means throughout the period we worked in the area. Sahel biome species (as defined in Fishpool & Evans 2001) observed in 2002–5 are marked “SB”. Sequence and nomenclature follow Borrow & Demey (2001).

Results

We list the 250 bird species for which we have been able to trace records from SE Niger. In addition to our own observations this includes the observations from Zone 4 in Giraudoux *et al.* (1988) plus additional records provided by P.J. Jones and

unpublished observations (NiBDaB) by W. Mullié. For each species the source of information is listed and, for the species recorded during our survey, an abundance assessment is given. Density estimates are presented for the species recorded during the transects counts in 2003 and 2005.

Podicipedidae

Podiceps nigricollis Black-necked Grebe. Six at Diffa, 23 Jan 1995 (NiBDaB).

Phalacrocoracidae

Phalacrocorax africanus Long-tailed Cormorant. C, Aug–Oct 2002–5. Several at Diffa, Tam and Agaram; Jan 1994 and 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Pelecanidae

Pelecanus onocrotalus Great White Pelican. Three over Désert du Tal, 27 Dec 1977 (Giraudoux *et al.* 1988).

Ardeidae

Ixobrychus minutus Little Bittern. C, along Komadougou Yobé, Aug–Oct 2002–5.

Ardeola ralloides Squacco Heron. C, along the Komadougou Yobé, Aug–Oct 2002–5. Transect density (in adjacent grassland): 0.4 per km² in Sep 2005 (zero in 2003). Also recorded at a temporary pond at Nguigmi, 22 Aug 2003. Several at Tam and Bagara, Jan 1994, and Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

Bubulcus ibis Cattle Egret. VA, Aug–Oct 2002–5. Transect density (in adjacent grassland): 62 per km² in Sep 2003, 48 per km² in Sep 2005. Many at Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988). Large numbers (probably over 25,000) were observed in Aug–Oct 2002, 2003 and 2005 within *c.* 25 km of the Komadougou Yobé from west of Boudum to Bosso. They were primarily associated with the cultivated area and adjacent grassland where they were observed feeding intensively on grasshoppers. They typically spent the middle of the day and the night at the river, moving to and from the feeding areas in large flocks during the day. No breeding colonies were observed in the area.

Butorides striatus Green-backed Heron. C, at the Komadougou Yobé, Aug–Oct 2002–5.

Egretta ardesiaca Black Heron. C, along the Komadougou Yobé, Aug–Oct 2005, but none seen 2002 and 2003.

E. garzetta Little Egret. C, along the Komadougou Yobé, Aug–Oct 2002–5. Several at Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB).

E. intermedia Intermediate Egret. F, along the Komadougou Yobé, Aug–Oct 2002–5. Also at temporary pond at Nguigmi, 22 Aug 2003. Recorded at Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

E. alba Great Egret. F, along the Komadougou Yobé, Aug–Oct 2002–5. Recorded at Diffa, Tam and Agaram, Jan 1994 and Diffa and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Ardea purpurea Purple Heron. F, along the Komadougou Yobé, Aug–Oct 2002–5. Also at Tam, Jan 1994, and Diffa, Tam and Agaram, Jan 1995 (NiBDaB).

A. cinerea Grey Heron. C, along the Komadougou Yobé, Aug–Oct 2002–5. Several at Tam, Diffa and Agaram, Jan 1994, and Diffa, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

A. melanocephala Black-headed Heron. C, Aug–Oct 2002–5. Several at Agaram, Jan 1994, and Diffa and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Scopidae

Scopus umbretta Hamerkop. One at a temporary pond near Sayam, 1 Oct 2005.

Ciconiidae

Anastomus lamelligerus African Openbill Stork. Flock of *c.* 30 at Komadougou Yobé, Aug 2002. Small flocks at Komadougou-Yobé, 29 Dec 1977 (Giraudoux *et al.* 1988)

Ciconia nigra Black Stork. A single bird circling over the grassland *c.* 10 km north of Diffa, 4 Oct 2005, appears to be the only record from the region (including NE Nigeria).

C. abdimii Abdim's Stork. VA, Aug–Oct 2002–5. Transect density: 7.4 per km² in Sep 2003; 22 per km² in Sep 2005. Large flocks were observed foraging in the grassland north of the Komadougou Yobé and in an area north of Kinzindi (Fig. 1). They were there from early Aug to late Sep or Oct and included a large proportion of juveniles. In 2003 their total number was estimated at *c.* 17,000, with numbers probably similar in 2002 and 2005 (Petersen *et al.* in press). Also common in Aug 1975 (Giraudoux *et al.* 1988). While in SE Niger the storks appeared to feed almost exclusively on medium size grasshoppers (Petersen *et al.* in press). In the morning and late afternoon they were typically spread out in the grassland in flocks of 30–200. When feeding, they often formed a “front of birds” and collectively walked or ran forward through the grass. This forced the grasshoppers to take off and the storks then tried to grab them in the air. This behaviour often attracted other bird species, in particular Black Kites and falcons (especially Lanners: see below), which swooped low over the storks to catch the low-flying grasshoppers in the air. By mid-day the storks typically congregated in flocks of up to several thousands and started to circle high over the grassland before flying to the Komadougou Yobé where they spent the middle of the day resting in the shallow water or in trees. Common in flocks near Cheri, 12 Aug 1975 (P.J. Jones *in litt.*) and Aug 1978 (Giraudoux *et al.* 1988).

C. episcopus Woolly-necked Stork. One resting at a temporary pond near Sayam, 1 Oct 2005.

C. ciconia White Stork. A flock of 1000 at a temporary pond 50 km southwest of Nguigmi, 21 Aug 2003; four at the same place, 3 Oct 2005; *c.* 100 30 km northeast of Diffa, 27 Sep 2005. The birds observed in August are unlikely to be migrants from Eurasia as those that follow the eastern flyway are known first to appear in S Sudan and Chad in mid-September (van den Bossche 2002). The same timing probably applies to the storks that take the western route over Gibraltar. It seems likely, therefore, that they were from the N African breeding population. Ringed White Storks breeding in Morocco, Algeria and Tunisia have been recovered from N Nigeria

(Elgood *et al.* 1994) and storks breeding in Algeria are known to leave the breeding area in mid-July and August to move south across the Sahara (Isenmann & Moali 2000). Flocks of 3, 25 and 100 were observed in the same area in Aug 1975 (Giraudoux *et al.* 1988).

Leptoptilos crumeniferus Marabou Stork. One in grassland near Diffa, 26 Sep 2003. Many seen between Maïné-Soroa and Nguigmi, Aug 1975, and small flocks at Komadougou Yobé, Dec 1977 (Giraudoux *et al.* 1988).

Phoenicopteridae

Platalea leucorodia Lesser Flamingo. Observed in late Feb and Oct 1970 at a small temporary lake among dunes north of L. Chad (Viellard 1972).

Threskiornithidae

Plegadis falcinellus Glossy Ibis. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988) and at Tam, Jan 1995 (NiBDaB).

Threskiornis aethiopicus Sacred Ibis. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988) and at Agaram, Jan 1994 (NiBDaB).

Anatidae

Dendrocygna bicolor Fulvous Whistling Duck. Six at Agaram, 22 Jan 1994 (NiBDaB).

D. viduata White-faced Whistling Duck. C, Aug–Oct 2002–5. 32 at Diffa and 618 at Tam, Jan 1994; 30 at Agaram and 532 at Diffa, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Alopochen aegyptiacus Egyptian Goose. Two at Tam, 22 Jan 1994; two at Diffa, 23 Jan 1995; one at Tam, 24 Jan 1995 (NiBDaB). One observation at Ngalaoua, 29 Dec 1977 (Giraudoux *et al.* 1988).

Plectropterus gambensis Spur-winged Goose. C, Aug–Oct 2002 and 2003; none in 2005. 26 at Agaram, 22 Jan 1994 (NiBDaB). In 1995, 23 were observed at Diffa, 23 Jan, and 6 at Agaram, 24 Jan (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Sarkidiornis melanotos Knob-billed Goose. F, Aug–Sep 2003; none in 2002 or 2005. In 1994, 45 observed at Diffa, 20 Jan 1994, and one at Tam, 22 Jan 1994 (NiBDaB). In 1995, 263 at Diffa, 23 Jan, and 60 at Tam, 24 Jan (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Nettapus auritus African Pygmy Goose. U, small numbers at Komadougou Yobé, Sep–Oct 2005. None observed in 2002 or 2003.

Anas capensis Cape Teal. A pair at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

A. acuta Northern Pintail. 100 at Agaram, 22 Jan 1994 (NiBDaB). Several thousand on the Komadougou Yobé, with a particularly large concentration at Abadam, Dec 1977 (Giraudoux *et al.* 1988).

A. hottentota Hottentot Teal. Flock of 25 at a temporary pond near Nguigmi, 22 Aug 2003.

A. querquedula Garganey. C. 350 at a temporary pond 30 km north of Diffa, 30 Sep 2005. In 1994, 415 at Tam, 20 Jan, 85 at Diffa, 22 Jan, and 2500 at Agaram, 22 Jan

(NiBDaB). In 1975, 500 at Diffa, 26 Feb and 30 at Cheri, 24 Aug (Giraudoux *et al.* 1988).

A. clypeata Northern Shoveler. C. 35 at a temporary pond 30 km north of Diffa, 30 Sep 2005.

Pandionidae

Pandion haliaetus Osprey. One at Komadougou Yobé near Diffa, 7 Oct 2005.

Accipitridae

Pernis apivorus European Honey Buzzard.. Three passing over Diffa, 29 Sep 2005.

Elanus caeruleus Black-shouldered Kite. C, Aug–Oct 2002–5. Density in grassland 0.1 per km² in Sep 2003; 0.1 per km² in Sep 2005. Observed at Tam and Agaram, Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Chelictinia riocourii African Swallow-tailed Kite. Five in grassland northwest of Diffa, 26 Sep 2002.

Milvus migrans Black Kite. VA, Aug–Oct 2002–5. Transect density: 6.3 per km² in Sep 2003, 2.8 per km² in Sep 2005. All individuals identified to subspecies were *M. m. parasitus*. Recorded in the 1970s (Giraudoux *et al.* 1988).

Neophron percnopterus Egyptian Vulture. At Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

Necrosyrtes monachus Hooded Vulture. Six at Tam, 24 Jan 1995 (NiBDaB). In the 1970s “common all year” (Giraudoux *et al.* 1988).

Gyps africanus African White-backed Vulture. Observed near Cheri, 12 Aug 1975 (P.J. Jones *in litt.*), between Diffa and Nguigmi, 22 Aug 1975, and between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

G. rueppellii Rüppell’s Griffon Vulture. Three between Diffa and Nguigmi, 22 Aug 2003. Observed at Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

Torgos tracheliotus Lappet-faced Vulture. At Maïné-Soroa, 24 Aug 1975, and at Abadam, 28 Dec 1977 (Giraudoux *et al.* 1988).

Trionocephus occipitalis White-headed Vulture. At Abadam, 28 Dec 1977, and at Gueskérou, 29 Dec 1977 (Giraudoux *et al.* 1988).

Circaetus gallicus Short-toed Eagle. F, Aug–Oct 2002–5.

C. beaudouini Beaudouin’s Snake Eagle. U, rainy season 2003 and 2005. Transect density: 0.3 per km² in 2003 (zero in 2005).

C. cinereus Brown Snake Eagle. U, Aug–Sep 2003; none in 2002 and 2005.

Terathopius ecaudatus Bateleur. Three between Maïné-Soroa and Diffa, 25 Feb 1975; several between Cheri and Maïné-Soroa and between Maïné-Soroa and Nguigmi, 24 Aug 1975 (Giraudoux *et al.* 1988).

Polyboroides typus African Harrier Hawk. F, Aug–Oct 2002–5.

Circus macrourus Pallid Harrier. F, Aug–Oct 2002–5. Observed at Agaram and Tam, Jan 1995 (NiBDaB).

C. pygargus Montagu’s Harrier. F, Aug–Oct 2002–5.

C. aeruginosus Eurasian Marsh Harrier. F Aug–Oct 2002–5. Observed at Diffa and Tam, Jan 1995 (NiBDaB).

Micronisus gabar Gabar Goshawk. F, Aug–Oct 2002–5. Observed at Diffa, Jan 1995 (NiBDaB).

Melierax metabates Dark Chanting Goshawk. C, Aug–Oct 2002–5. Transect density: 0.7 per km² in Sep 2003 (zero in 2005). Also recorded Jan 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

Accipiter badius Shikra. C, Aug–Oct 2002–5. Transect density: 0.8 per km² in Sep 2003, 0.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Butastur rufipennis Grasshopper Buzzard. A, Aug–Oct 2002–5. Transect density: 19 per km² in Sep 2003, 11 per km² in Sep 2005. Abundant in the grasslands in the S and E of the study area from the beginning of Aug to mid- or late Oct. Most were juveniles. The buzzards fed almost exclusively on grasshoppers on the ground by either swooping down from trees to grab them on the ground or by walking and catching the grasshoppers with their feet. Also recorded in Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

Buteo rufinus Long-legged Buzzard. One at Diffa, 23 Jan 1995 (NiBDaB).

B. auguralis Red-necked Buzzard. C, Aug–Oct 2002–5. Transect density: 1.8 per km² in Sep 2003, 2.1 per km² in Sep 2005. Also recorded Jan 1995 (NiBDaB) and Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

Aquila pomarina Lesser Spotted Eagle. R; one between Maïné-Soroa and Diffa, 7 Oct 2005.

A. rapax Tawny Eagle. C, Aug–Oct 2002–5. Transect density 0.1 per km² in Sep 2005 (zero in 2003). Recorded in the 1970s (Giraudoux *et al.* 1988).

A. wahlbergi Wahlberg's Eagle. One at Komadougou-Yobé west of Diffa, 30 Jul 2002.

Hieraaetus pennatus Booted Eagle. C, Sep–Oct 2005, U in Aug–Sep 2002–3.

Sagittariidae

Sagittarius serpentarius Secretary Bird. "Frequently observed near Nguigmi" (Rousselot 1947). Observed between Cheri and Maïné-Soroa, 12 Aug 1975, and south of Maïné-Soroa, 25 Dec 1977 (Giraudoux *et al.* 1988).

Falconidae

Falco naumanni Lesser Kestrel. A flock of 35 feeding on grasshoppers flushed by foraging Abdim's Storks c. 10 km east of Maïné-Soroa, 26 Sep 2005.

F. tinnunculus Common Kestrel. F, Aug–Oct 2002–5. Transect density: 0.4 per km² in Sep 2005 (zero in 2003). Recorded in the 1970s (Giraudoux *et al.* 1988).

F. alopex Fox Kestrel. SGB. C, Aug–Sep 2002; F, Sep–Oct 2003 and 2005. Transect density: 0.2 per km² in Sep 2005 (zero in 2003).

F. ardosiaceus Grey Kestrel. One at Diffa, 20 Aug 2003; one near Sayam, 1 Oct 2005. One, 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

F. chicquera Red-necked Falcon. F, Aug–Oct 2002–5. Transect density: 0.2 per km² in Sep 2005 (zero in 2003).

F. vespertinus Red-footed Falcon..One near Maïné-Soroa, 25 Sep 2005.

F. subbuteo Eurasian Hobby. U, Aug–Oct 2002–5.

F. cuvierii African Hobby. One chasing grasshoppers flushed by foraging Abdim's Storks near Maïné-Soroa, 24 Sep 2005.

F. biarmicus Lanner Falcon. C, Aug–Oct 2002–5. Transect density: 1.7 per km² in Sep 2003, 1.4 per km² in Sep 2005. Lanners were very numerous in SE Niger in Aug–Oct 2002, 2003 and 2005, in particular in areas with feeding flocks of Abdim's Storks. As soon as storks started to feed on grasshoppers, Lanners arrived and started flying low over them to grab flushed grasshoppers in mid-air. Up to four Lanners were observed feeding together over a flock of storks. It seems likely that several hundred Lanners were congregated in SE Niger during these periods.

Phasianidae

Coturnix coturnix Common Quail. C, Sep–Oct 2005; none in 2002 and 2003. Transect density 0.6 per km² in Sep 2005.

Francolinus clappertoni Clapperton's Francolin. F, Sep 2003; none in 2002 or 2005. Transect density 0.3 per km² in Sep 2003. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

Turnicidae

Ortyxelos meiffrenii Quail-plover. F, Sep 2003; two, 27 Sep 2005; none in 2002. Transect density: 1.3 per km² in Sep 2003 (zero in 2005). Observed at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

Turnix sylvatica Little Buttonquail. A single observation, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km² in Sep 2003 (zero in 2005).

Rallidae

Amaurornis flavirostris Black Crake. Observed at Bosso, 28 Dec 1977 (Giraudoux *et al.* 1988).

Gallinula chloropus Common Moorhen. C, along Komadougou Yobé, Aug–Oct 2002–5. At Diffa and Tam, Jan 1995 (NiBDaB).

Gruidae

Balearica pavonina Black Crowned Crane. Between Cheri and Maïné-Soroa, 24 Aug 1975; at Kaadjia. 13 Aug 1975; at Ngalaoua, 29 Dec 1977 (Giraudoux *et al.* 1988).

Otididae

Neotis denhami Denham's Bustard. A single bird and a pair observed in grassland c. 20 km north of Diffa, 25 Sep 2003. Two between Nguigmi and Maïné-Soroa, 23 Aug 1975 (Giraudoux *et al.* 1988).

N. nuba Nubian Bustard. SB. Observed twice: a pair in a mosaic of grassland and millet fields near Diffa, 24 Sep 2002; another pair in similar habitat near Diffa, 26 Sep 2003. In Aug 1975 several were observed and three nests found in the Dillia de Lagana valley between 130 and 167 km northwest of Nguigmi just north of Zone 4 (Giraudoux *et al.* 1988). The pairs near Diffa during the rains in 2002 and 2003 suggest that the grasslands west of L. Chad may still hold a breeding population of this rare bustard.

Ardeotis arabs Arabian Bustard. SB. One in grassland northwest of Diffa, 24 Sep 2002.

Eupodotis senegalensis White-bellied Bustard. One near Diffa, 23 Sep 2003.

E. melanogaster Black-bellied Bustard. F, Sep 2002; U, Sep 2003; none in 2005. Transect density: 0.3 per km² in Sep 2003.

Jacanidae

Actophilornis africana African Jacana. C, at Komadougou Yobé, Aug–Oct 2002–5. At Diffa, Tam and Agaram, Jan 1994 and 1995 (NiBDaB).

Microparra capensis Lesser Jacana. One at Tam, 22 Jan 1994 (NiBDaB).

Recurvirostridae

Himantopus himantopus Black-winged Stilt. C, Aug–Oct 2002–5. At Diffa, Tam and Agaram, Jan 1994; at Diffa, Tam and Agaram, Jan 1995 (NiBDaB). Common at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

Recurvirostra avosetta Pied Avocet. At Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

Burhinidae

Burhinus senegalensis Senegal Thick-knee. Ten between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

B. capensis Spotted Thick-knee. C, Aug–Oct 2002–5. Transect density: 1.7 per km² in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

Glareolidae

Pluvianus aegyptius Egyptian Plover. Flock of eight at Komadougou Yobé near Diffa, 23 Aug 2003.

Rhinoptilus chalcopterus Bronze-winged Courser. Two in farmland near Diffa, 24 Sep 2005.

Glareola cinerea Grey Pratincole. Observed at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

Charadriidae

Charadrius dubius Little Ringed Plover. Small numbers at Diffa and Tam, Jan 1994 and 1995 (NiBDaB). Observed at Kaadjia, 13 Aug 1975, and at Abadam, 28 Dec 1977 (Giraudoux *et al.* 1988).

C. pecuarius Kittlitz's Plover. Five at Diffa, 20 Jan 1995, and two, 23 Jan 1995 (NiBDaB). Observed at Kaadjia, 13 Aug 1975, and at Diffa, 25 Dec 1977 (Giraudoux *et al.* 1988).

C. marginatus White-fronted Plover. One at Diffa, 20 Jan 1994 (NiBDaB). Observed at Kaadjia, 24 Aug 1975 (Giraudoux *et al.* 1988).

Vanellus tectus Black-headed Lapwing. A, Aug–Oct 2002–5. Transect density: 34 per km² in Sep 2003, 25 per km² in Sep 2005. Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

V. spinosus Spur-winged Lapwing. C, Aug–Oct 2002–5. Transect density: 0.7 per km² in Sep 2003 (zero in 2005). Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

Scolopacidae

Calidris minuta Little Stint. At Diffa, 351 on 22 Jan 1994 and two, 23 Jan 1995 (NiBDaB). Observed at Cheri, 24 Aug 1975, and Bosso, 28 Dec 1977 (Giraudoux *et al.* 1988).

C. temminckii Temminck's Stint. U, Aug–Oct 2002–5.

Philomachus pugnax Ruff. F, Aug–Oct 2002–5. At Diffa, 398 on 20 Jan 1994 and five, 23 Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Gallinago gallinago Common Snipe. Fifteen at Diffa, 20 Jan 1994; one at Tam, 22 Jan 1994; one at Tam, 24 Jan 1995 (NiBDaB). At Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

Limosa limosa Black-tailed Godwit. 32 at Diffa, 20 Jan 1994 (NiBDaB).

Tringa erythropus Spotted Redshank. Four at a temporary pond near Sayam, 1 Oct 2005. 710 at Diffa, 20 Jan 1994 (NiBDaB). One at Cheri, 24 Aug 1975 (Giraudoux *et al.* 1988).

T. totanus Common Redshank. U, Aug–Oct 2002–5.

T. stagnatilis Marsh Sandpiper. Two at a temporary pond near Sayam, 1 Oct 2005. One at Tam, 22 Jan 1994 (NiBDaB).

T. nebularia Common Greenshank. At Diffa, 25 on 20 Jan 1994 and one, 23 Jan 1995 (NiBDaB).

T. ochropus Green Sandpiper. F, Aug–Oct 2002–5. Transect density: 0.1 per km² in Sep 2003, 0.1 per km² in Sep 2005. Five at Diffa, 23 Jan 1995 (NiBDaB).

T. glareola Wood Sandpiper. F, Aug–Oct 2002–5. Transect density: 0.8 per km² in Sep 2005 (zero in 2003). Recorded Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

Actitis hypoleucos Common Sandpiper. F, Aug–Oct 2002–5. Four at Diffa, 23 Jan 1995 (NiBDaB). Recorded in the 1970s (Giraudoux *et al.* 1988).

Sternidae

Chlidonias hybridus Whiskered Tern. C, along the Komadougou Yobé near Diffa, Aug–Oct 2002–2005. Three at Diffa, 20 Jan 1994 (NiBDaB).

C. leucopterus White-winged Tern. Observed at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988).

Pteroclididae

Pterocles exustus Chestnut-bellied Sandgrouse. C, Aug–Oct 2002–5. Transect density: 1.7 per km² in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

P. quadricinctus Four-banded Sandgrouse. C, Aug–Oct 2002–5. Transect density: 2.5 per km² in Sep 2003, 1.1 per km² in Sep 2005. Between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

Columbidae

Treron waalia Bruce's Green Pigeon. Three in Diffa, 20 Aug 2003.

Oena capensis Namaqua Dove. A, Aug–Oct 2002–5. Transect density: 18 per km² in Sep 2003, 10 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Columba guinea Speckled Pigeon. C, Aug–Oct 2002–5. Transect density: 0.3 per km² in Sep 2003, 0.2 per km² in Sep 2005. Observed at Cheri and Kaadjia, 12–13 Aug 1975 (Giraudoux *et al.* 1988).

Streptopelia decipiens African Mourning Dove. F, Aug–Oct 2002–5. Transect density: 0.6 per km² in Sep 2005 (zero in 2003).

S. vinacea Vinaceous Dove. A, Aug–Oct 2002–5. Transect density: 6.2 per km² in Sep 2003, 7.8 per km² in Sep 2005.

S. roseogrisea African Collared Dove. SB. VA, Aug–Oct 2002–5. Transect density: 42 per km² in Sep 2003, 19 per km² in Sep 2005. Very common at Kaadjia, 25 Feb 1975 and common between Cheri and Nguigmi, 12 Aug 1975 (Giraudoux *et al.* 1988).

S. turtur European Turtle Dove. C, Sep 2003; none in 2002 and 2005. Transect density: 10 per km² in Sep 2003.

S. senegalensis Laughing Dove. A, Aug–Oct 2002–5. Transect density: 10 per km² in Sep 2003, 2.5 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Psittacidae

Psittacula krameri Rose-ringed Parakeet. U, Aug–Oct 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Musophagidae

Crinifer piscator Western Grey Plantain-eater. F, Aug–Oct 2002–5.

Cuculidae

Oxylophus jacobinus Jacobin Cuckoo. F, Aug–Oct 2002–5. Transect density: 0.3 per km² in Sep 2003, 0.8 per km² in Sep 2005.

Clamator glandarius Great Spotted Cuckoo. F, Aug–Oct 2002–5. Transect density: 1.0 per km² in Sep 2003, 0.5 per km² in Sep 2005.

Cuculus solitarius Red-chested Cuckoo. A single observation near Diffa, 25 Sep 2003, the first record for Niger (Christensen *et al.* 2005).

C. canorus Common Cuckoo. Observed 113 km south of Nguigmi on the way to Mainé-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

Chrysococcyx klaas Klaas's Cuckoo..One near Diffa, 1 Aug 2003.

C. caprius Didric Cuckoo. F, Aug–Oct 2002–5.

Centropus senegalensis Senegal Coucal. C, Aug–Oct 2002–5.

Strigidae

Ptilopsis leucotis White-faced Owl. One at Sayam, 1 Oct 2005.

Bubo africanus Spotted Eagle Owl. One, west of Diffa, 31 Jul 2002.

B. lacteus Verreaux's Eagle Owl. One, northeast of Diffa, 23 Sep 2005.

Apodidae

Cypsiurus parvus African Palm Swift. C, Aug–Oct 2002–5.

Apus pallidus Pallid Swift. One over Diffa, 6 Oct 2005.

A. apus Common Swift. C, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

A. caffer White-rumped Swift. One foraging over a pond north of Diffa, 27 Sep 2005; one with Little Swifts in Diffa, 6 Oct 2005.

A. affinis Little Swift. A, Aug–Oct 2002–5.

Coliidae

Urocolius macrourus Blue-naped Mousebird. F, Aug–Oct 2002–5. Transect density: 0.9 per km² in Sep 2003, 1.4 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Alcedinidae

Halcyon leucocephala Grey-headed Kingfisher. F, Sep 2003 and Sep–Oct 2005.

H. senegalensis Woodland Kingfisher. F, Aug–Oct 2002–5. Transect density: 0.3 per km² in Sep 2003 (zero in 2005).

H. chelicuti Striped Kingfisher. F, Aug–Oct 2002–5. Transect density: 0.4 per km² in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

Alcedo cristata Malachite Kingfisher. C, along Komadougou Yobé, Aug–Oct 2002–5. Observed at Diffa, Jan 1995 (NiBDaB).

Ceryle rudis Pied Kingfisher. C, along Komadougou Yobé, Aug–Oct 2002–5. Recorded in Jan 1994 and 1995 (NiBDaB) and in the 1970s (Giraudoux *et al.* 1988).

Meropidae

Merops pusillus Little Bee-eater. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

M. albicollis White-throated Bee-eater. A–VA, Aug–Oct 2002–5. Transect density: 18 per km² in Sep 2003, 34 per km² in Sep 2005. In addition to the birds on stopover that were recorded on the transects, very large numbers were observed on southward migration in Sep–Oct 2003 and 2005. Throughout SE Niger flocks of 10–50 were observed resting in trees and bushes. About half of them were juveniles. They mainly took grasshoppers, either in the air or on the ground, mostly without landing. Recorded in the 1970s (Giraudoux *et al.* 1988).

M. orientalis Little Green Bee-eater. C, Aug–Oct 2002–5. Transect density: 1.6 per km² in Sep 2003 (zero in 2005). Recorded in the 1970s (Giraudoux *et al.* 1988).

M. nubicus Northern Carmine Bee-eater. C, at Komadougou Yobé near Diffa, Aug 2002. Recorded in the 1970s (Giraudoux *et al.* 1988).

Coraciidae

Coracias naevia Rufous-crowned Roller. Near Diffa, 24 Aug 1975 (Giraudoux *et al.* 1988).

C. abyssinicus Abyssinian Roller. A, Aug–Oct 2002–5. Transect density: 16 per km² in Sep 2003, 24 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Phoeniculidae

Phoeniculus purpureus Green Wood-hoopoe. C, Aug–Oct 2002–5. Transect density: 0.8 per km² in Sep 2003, 0.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Rhinopomastus aterrimus Black Wood-hoopoe. F, Aug–Oct 2002–5. Transect density: 0.2 per km² in Sep 2003, 0.1 per km² in Sep 2005.

Upupidae

Upupa epops Hoopoe. C, Aug–Oct 2002–5. Transect density: 2.9 per km² in Sep 2003, 3.0 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Bucerotidae

Tockus erythrorhynchus Red-billed Hornbill. C, Aug–Oct 2002–5. Transect density: 2.5 per km² in Sep 2003, 5.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

T. nasutus African Grey Hornbill. A, Aug–Oct 2002–5. Transect density: 6.7 per km² in Sep 2003, 37 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Capitonidae

Lybius vieilloti Vieillot's Barbet. F, Aug–Oct 2002–5. Transect density: 0.7 per km² in Sep 2003, 0.6 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Trachyphonus margaritatus Yellow-breasted Barbet. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

Picidae

Jynx torquilla Eurasian Wryneck. U, Aug–Oct 2002–5. Transect density: 0.5 per km² in Sep 2003, 0.4 per km² in Sep 2005.

Dendropico elachus Little Grey Woodpecker. SB. U, Aug–Oct 2002–5. Transect density: 0.7 per km² in Sep 2003 (zero in 2005).

D. goertae Grey Woodpecker. Observed at Kaadjia, 13 Aug 1975, and 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

Alaudidae

Mirafra cantillans Singing Bush Lark. A, Aug–Oct 2002–5. Transect density: 25 per km² in Sep 2003, 18 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Pinarocorys erythropygia Rufous-rumped Lark. U, Sep 2003; not seen in 2002 and 2005. Transect density: 1.1 per km² in Sep 2003.

Eremalauda dunni Dunn's Lark. SB. F, Sep 2003; none in 2002 and 2005. Transect density: 2.2 per km² in Sep 2003.

Galerida cristata Crested Lark. C, Aug–Oct 2002–5. Transect density: 2.1 per km² in Sep 2003, 0.7 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Eremopterix leucotis Chestnut-backed Sparrow Lark. A, Aug–Oct 2002–5. Transect density: 32 per km² in Sep 2003, 35 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

E. nigriceps Black-crowned Sparrow Lark. A, Aug–Oct 2002–5. Transect density: 20 per km² in Sep 2003, 3.2 per km² in Sep 2005. Also recorded in Mar and in large numbers in Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones *in litt.*).

Hirundinidae

Riparia paludicola Plain Martin. F, Sep–Oct 2005.

R. riparia Common Sand Martin. C, Aug–Oct 2002–5.

Hirundo daurica Red-rumped Swallow. F, Aug–Oct 2002–5.

H. aethiopica Ethiopian Swallow. C, Aug–Oct 2002–5.

H. rustica Barn Swallow. A, Aug–Oct 2002–5.

Motacillidae

Motacilla flava Yellow Wagtail. C, Aug–Oct 2002–5. Transect density: 2.2 per km² in Sep 2003, 3.6 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Anthus campestris Tawny Pipit. Three in a tree in grassland near Diffa, 24 Sep 2002; one near Sayam, 1 Oct 2005.

A. trivialis Tree Pipit. C, Sep 2003; none in 2002 and 2005. Transect density: 3.9 per km² in Sep 2003.

Pycnonotidae

Pycnonotus barbatus Common Bulbul. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

Turdidae

Cercotrichas galactotes Rufous Scrub Robin. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

C. podobe Black Scrub Robin. SB. C, Aug–Oct 2002–5. Transect density: 6.8 per km² in Sep 2003, 10 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Saxicola rubetra Whinchat. C, Aug–Oct 2002–5. Transect density: 1.2 per km² in Sep 2003, 1.1 per km² in Sep 2005.

Oenanthe oenanthe Northern Wheatear. C, Aug–Oct 2002–5. Transect density: 2.0 per km² in Sep 2003, 5.6 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

O. hispanica Black-eared Wheatear. C, Aug–Oct 2002–5. Transect density: 1.2 per km² in Sep 2003, 2.2 per km² in Sep 2005.

O. heuglini Heuglin's Wheatear. F, Sep 2002 and 2003; none in 2005. Transect density: 0.4 per km² in Sep 2003.

O. isabellina Isabelline Wheatear. C, Sep 2002 and 2003; none in 2005. Transect density: 2.0 per km² in Sep 2003.

Myrmecocichla aethiops Northern Anteater Chat. U, Sep 2002 and Sep 2005 near Diffa; none in 2003.

Sylviidae

Hippolais pallida Olivaceous Warbler. C, Aug–Oct 2002–5. Transect density: 1.3 per km² in Sep 2003, 4.3 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Cisticola ruficeps Red-pate Cisticola. F, Sep 2002 and 2003. Transect density: 0.5 per km² in Sep 2003.

C. juncidis Zitting Cisticola. C, Sep 2003; none in 2002 and 2005. Transect density: 1.6 per km² in Sep 2003.

C. aridus Desert Cisticola. C, Aug–Oct 2002–5. Transect density: 9.9 per km² in Sep 2003, 8.6 per km² in Sep 2005.

Prinia subflava Tawny-flanked Prinia. A pair near Maïné-Soroa, 30 Jul 2002.

P. fluviatilis River Prinia. SB. A pair observed building nest in low vegetation flooded by the Komadougou Yobé at Diffa, 23 Sep 2005. The nest was only a few m from the road bridge over the river to Nigeria. The birds were still finishing the nest on 29 Sep. Since it has been uncertain if the type locality of this species was in Mali or Niger (Brouwer *et al.* 2001), this appears to be the first definite record from Niger.

Spiloptila clamans Cricket Warbler. SB. A, Aug–Oct 2002–5. Transect density: 14 per km² in Sep 2003, 21 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Phyllolais pulchella Buff-bellied Warbler. A pair c. 40 km west of Diffa, 25 Sep 2005, the first record for Niger (Christensen *et al.* 2005).

Camaroptera brachyura Grey-backed Camaroptera. F, Aug–Oct 2002–5, in gardens in Diffa. Recorded in the 1970s (Giraudoux *et al.* 1988).

Eremomela icteropygialis Yellow-bellied Eremomela. C, Aug–Oct 2002–5. Transect density: 1.1 per km² in Sep 2003, 1.5 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Sylvietta brachyura Northern Crombec. Observed at Kaadija, 26 Feb 1975 (Giraudoux *et al.* 1988).

Phylloscopus collybita Chiffchaff. F, Sep 2002 and 2003; none in 2005. Transect density: 0.7 per km² in Sep 2003.

P. trochilus Willow Warbler. C, Sep 2003; none in 2002 and 2005. Transect density: 4.7 per km² in Sep 2003.

P. sibilatrix Wood Warbler. A, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km² in Sep 2003.

P. bonelli Western Bonelli's Warbler. One northeast of Diffa, 23 Sep 2002.

Sylvia hortensis Orphean Warbler. Observed in Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

S. borin Garden Warbler. C, Sep 2003. Transect density: 1.3 per km² in Sep 2003 (none in 2005).

S. communis Common Whitethroat. C, Sep 2003; F, Sep–Oct 2005; none in 2002. Transect density: 1.3 per km² in Sep 2003, 0.6 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

S. curruca Lesser Whitethroat. F, Sep 2003; none in 2002 and 2005. Transect density: 0.7 per km² in Sep 2003. Common in Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

S. cantillans Subalpine Warbler. C, Sep 2002 and 2003; A, Sep–Oct 2005. Transect density: 0.7 per km² in Sep 2003, 21 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Muscicapidae

Melaenornis pallidus Pale Flycatcher. One near Diffa, 24 Sep 2002.

Muscicapa striata Spotted Flycatcher. C, Aug–Oct 2002–5. Transect density: 2.7 per km² in Sep 2003, 8.5 per km² in Sep 2005.

Remizidae

Anthoscopus punctifrons Sennar Penduline Tit. SB. A pair near Diffa, 24 Sep 2002.

Nectariniidae

Hedydipna platura Pygmy Sunbird. C, Aug–Oct 2002–5. Transect density: 2.7 per km² in Sep 2003, 1.5 per km² in Sep 2005.

Cinnyris pulchellus Beautiful Sunbird. C, Aug–Oct 2002–5. Transect density: 2.1 per km² in Sep 2003, 1.3 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Laniidae

Lanius meridionalis Southern Grey Shrike. A, Aug–Oct 2002–5. Transect density: 8.5 per km² in Sep 2003, 6.3 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

L. collurio Red-backed Shrike. F, Sep 2003; none in 2002 and 2005. Transect density: 1.0 per km² in Sep 2003.

L. senator Woodchat Shrike. A, Aug–Oct 2002–5. Transect density: 9.1 per km² in Sep 2003, 8.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Malaconotidae

Laniarius barbarus Yellow-crowned Gonolek. F, Sep 2002 near the Komadougou Yobé; none in 2003 and 2005. Common along the river, Dec 1977 (Giraudoux *et al.* 1988).

Nilaus afer Brubru. F Sep 2003; none in 2002 and 2005. Transect density: 1.0 per km² in Sep 2003.

Oriolidae

Oriolus oriolus Eurasian Golden Oriole. C, Sep 2003 and Sep–Oct 2005; none in 2002. Transect density: 2.5 per km² in Sep 2003, 6.1 per km² in Sep 2005.

Dicruridae

Dicrurus adsimilis Fork-tailed Drongo. Observed 130 km south of Nguigmi, 24 Aug 1975 (Giraudoux *et al.* 1988).

Corvidae

Corvus ruficollis Brown-necked Raven. F, Aug–Oct 2002–5. Recorded in the 1970s (Giraudoux *et al.* 1988).

C. albus Pied Crow. C, Aug–Oct 2002–5 (in towns). Recorded in the 1970s (Giraudoux *et al.* 1988).

Ptilostomus afer Piapiac. Observed in an oasis between Cheri and Maïné-Soroa, 24 Aug 1975 (Giraudoux *et al.* 1988).

Sturnidae

Lamprotornis purpureus Purple Glossy Starling. U, Sep 2002.

L. chalybaeus Greater Blue-eared Starling. A, Aug–Oct 2002–5. Transect density: 11 per km² in Sep 2003, 14 per km² in Sep 2005.

L. caudatus Long-tailed Glossy Starling. U, Sep–Oct 2005; none in 2002 and 2003. Transect density 0.1 per km² in Sep 2005.

L. pulcher Chestnut-bellied Starling. SB. A, Aug–Oct 2002–5. Transect density: 25 per km² in Sep 2003, 22 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Buphagidae

Buphagus africanus Yellow-billed Oxpecker. F, Sep 2002 and Sep–Oct 2005; none in 2003. Transect density: 0.3 per km² in Sep 2005.

Passeridae

Passer domesticus House Sparrow. A male in Nguigmi, 21 Aug 2003. None recorded in 2005 in spite of search.

P. griseus Northern Grey-headed Sparrow. VA, Aug–Oct 2002–5. Transect density: 23 per km² in Sep 2003, 53 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

P. luteus Sudan Golden Sparrow. SB. VA, Aug–Oct 2002–5. Transect density: 330 per km² in Sep 2003, 1600 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Petronia pyrgita Yellow-spotted Petronia. One near the road between Diffa and Maïné-Soroa, 26 Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

P. dentata Bush Petronia. F, Aug–Oct 2002–5. Transect density: 0.7 per km² in Sep 2003, 1.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Ploceidae

Bubalornis albirostris White-billed Buffalo Weaver. A, Aug–Oct 2002–5. Transect density: 16 per km² in Sep 2003, 24 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Sporopipes frontalis Speckle-fronted Weaver. C, Aug–Oct 2002–5. Transect density: 3.9 per km² in Sep 2003, 8.2 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Ploceus luteolus Little Weaver. C, Aug–Oct 2002–5. Transect density: 0.5 per km² in Sep 2003, 10 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

P. velatus African Masked Weaver. C, Sep 2002 and 2003. Transect density: 5.8 per km² in Sep 2003. None in 2005.

P. cucullatus Village Weaver. C, Aug–Oct 2002–5.

P. melanocephalus Black-headed Weaver. F, Sep–Oct 2005 along Komadougou Yobé; none in 2002 and 2003.

Quelea quelea Red-billed Quelea. A, Sep 2003; none in 2002 and 2005. Transect density: 4.5 per km² in Sep 2003. Recorded in the 1970s (Giraudoux *et al.* 1988).

Euplectes afer Yellow-crowned Bishop. F, Sep 2003 and Sep–Oct 2005. Transect density: 0.7 per km² in Sep 2003, 1.8 per km² in Sep 2005.

E. franciscanus Northern Red Bishop. C, Aug–Oct 2002–5. Transect density: 6.2 per km² in Sep 2003, 0.7 per km² in Sep 2005. Recorded at Cheri, 12 Aug 1975 (P.J. Jones *in litt.*).

Estrilididae

Pytilia melba Green-winged Pytilia. Observed in Kaadjia, 26 Feb and 13 Aug 1975, and 110 km south of Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

Lagonosticta senegala Red-billed Firefinch. C, Aug–Oct 2002–5. Transect density: 1.9 per km² in Sep 2003, 2.2 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Uraeginthus bengalus Red-cheeked Cordon-bleu. C, Aug–Oct 2002–5. Transect density: 1.2 per km² in Sep 2003, 4.4 per km² in Sep 2005.

Lonchura cantans African Silverbill. F, Sep–Oct 2005; none in 2002 and 2003. Transect density: 0.3 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Amadina fasciata Cut-throat. C, Aug–Oct 2002–5. Transect density: 5.6 per km² in Sep 2003, 5.1 per km² in Sep 2005.

Viduidae

Vidua chalybeata Village Indigobird. F, Sep 2003; none in 2002 and 2005. Transect density: 1.2 per km² in Sep 2003. Recorded in Nguigmi, 23 Aug 1975 (Giraudoux *et al.* 1988).

V. orientalis Sahel Paradise Whydah. F, Aug–Oct 2002–5. Transect density: 1.1 per km² in Sep 2003, 0.3 per km² in Sep 2005. Recorded at Kaadjia, 13 Aug 1975 (Giraudoux *et al.* 1988), and at Cheri, 12 Aug 1975 (P.J. Jones *in litt.*).

Fringillidae

Serinus leucopygius White-rumped Seedeater. F, Sep–Oct 2005; none in 2002 and 2003. Transect density: 1.0 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

Emberizidae

Emberiza tahapisi Cinnamon-Breasted Rock Bunting. F, Aug–Oct 2002–5. Transect density: 1.7 per km² in Sep 2003, 0.8 per km² in Sep 2005. Recorded in the 1970s (Giraudoux *et al.* 1988).

E. flaviventris African Golden-breasted Bunting. Observed at Kaadjia, 26 Feb 1975 (Giraudoux *et al.* 1988).

Discussion

Limitations to the list of birds known from SE Niger

The number of bird species recorded in SE Niger will most likely increase when more field studies are carried out. At Malamfatori in NE Nigeria, c. 10 km south of Bosso, 311 bird species were encountered in 1997–2000, of which 105 were Palaearctic migrants (Gustafsson *et al.* 2003). The tree cover at Malamfatori may be slightly denser than north of the border and the study in Nigeria included netting on the old lake bottom (Ottosson *et al.* 2002), a habitat that has so far not been studied on the Niger side. There has been no netting in SE Niger and this may partly explain the lower number of Palaearctic passerines recorded. Species recorded at Malamfatori that are probably also present on the Niger side of the border include the five species of nightjars (no nightjars have been recorded from SE Niger), Black-billed Wood Dove *Turtur abyssinicus*, Black-headed Tchagra *Tchagra senegala*, Black-headed Gonolek *Laniarius erythrogaster*, Orange-cheeked Waxbill *Estrilda melpoda* and Black-rumped Waxbill *E. troglodytes*, which are all common just south of the border (Gustafsson *et al.* 2003). Some major differences do seem to exist, however, between the avifauna in SE Niger and neighbouring Nigeria. For instance, the large flocks of Abdim's Storks and Cattle Egrets and the high density of Grasshopper Buzzards in the southern part of SE Niger in Aug–Oct have not been noted for NE Nigeria.

Post-breeding congregations

We noted that several bird species (particularly Cattle Egret, Abdim's Stork, Grasshopper Buzzard, Red-necked Buzzard, Lanner Falcon, White-throated Bee-eater, Abyssinian Roller and African Grey Hornbill) were present in very high numbers compared to other parts of S Niger at the same time of year.

In Niger, Cattle Egrets usually breed in dense colonies in large trees in or just outside villages (pers. obs.). We saw scattered colonies further west in the central-southern part of Niger, but none in SE Niger. The many egrets associated with the grasslands and cultivation close to the Komadougou Yobé had therefore possibly arrived from breeding areas elsewhere, perhaps most likely from N Nigeria where large colonies are known in the Hadejia Wetlands (Elgood *et al.* 1994).

The breeding population of Abdim's Stork in SE Niger is relatively small, probably c. 100 pairs (unpubl. data). The young fledge around mid-Sep, but data (unpubl.) from satellite-tagged storks further west in Niger have shown that the young and adults usually stay in the nesting area until early Oct or early Nov. This strongly suggests that the large flocks of Abdim's Storks with a high proportion of juveniles

that arrived in SE Niger in early Aug, must come from breeding areas south of Niger, where the rainy season and consequently the nesting period start earlier (Petersen *et al.* in press).

The breeding status of the Grasshopper Buzzard in Niger is uncertain. Breeding is thought to take place during the rainy season (cf. Brouwer *et al.* 2000). The main nesting area is believed to be in the Sudan savanna further south (Thiollay 1978). The high numbers of this species observed in SE Niger between early Aug and early Oct, including many juveniles, point to an origin south of Niger where breeding starts earlier.

The Cattle Egrets, Abdim's Storks and Grasshopper Buzzards we observed in SE Niger during Aug–Oct all appeared to feed almost exclusively on grasshoppers. Their occurrence in high numbers outside or at the limit of their breeding area suggests a northwards post-breeding movement into SE Niger to utilise a superabundant food source for a couple of months before moving south as the dry season develops. High densities of Abdim's Stork and Cattle Egret were also recorded further west in N-central Niger in Sep but not in Jun–Jul (Petersen *et al.* in press). This suggests that these species make widespread northern movements at the end of the rains as an adaptation to the seasonal abundance of grasshoppers in the northern grassland. To what extent the high densities of Lanner Falcon in SE Niger during Aug–Nov reflect northern movements are less clear. This species is widespread throughout Sahelian Niger, and the high numbers observed may just be opportunistic congregation.

Abyssinian Roller and African Grey Hornbill were also observed in unexpectedly high densities, considering the relatively low number of potential nesting trees in SE Niger. Flocks of African Grey Hornbills were regularly observed flying in from the south. This was also observed in other parts of S Niger during the rains (pers. obs.). However, the densities of African Grey Hornbill in Jul–Sep in south-central Niger between Zinder and Tanout, with roughly the same precipitation and tree cover, only reached 1.1 per km² (Petersen *et al.* 2007), while the densities in SE Niger in September 2003 and 2005 were 6.7 per km² and 37 per km², respectively. Migration of Abyssinian Rollers into SE Niger from the south was not observed, but most likely took place unnoticed as this species was recorded in densities of only 3.6 per km² between Zinder and Tanout in Jul–Sep (Petersen *et al.* 2007) and 16 per km² and 24 per km² in SE Niger in September 2003 and 2005, respectively. Many juveniles were observed of both Abyssinian Rollers and Grey Hornbills, suggesting that these species made post-breeding movements with their young to SE Niger, to feed on the abundance of grasshoppers.

The White-throated Bee-eater breeds in the northernmost sector of the Sahel during the rains (Fry & Harwin 1988). Some of the birds observed in SE Niger may therefore be local breeders, but the vast majority were undoubtedly on southward migration with their young from breeding sites further north. The very high densities recorded in Sep 2003 and 2005 (18 and 34 per km², respectively), most likely represent birds that briefly stopped during their southward migration to feed on grasshoppers before continuing south. It is unknown if the bee-eaters migrate south on

a broad front, or if the high densities in SE Niger are of birds from a large breeding area that have moved specifically to this area.

Trend over the past 30 years for certain species

The limited fieldwork that has been carried out in SE Niger before 2002 makes it difficult to assess trends, but there are a number of exceptions. In the 1970s, six species of vulture were recorded from SE Niger, of which five appeared to be relatively common (Giraudoux *et al.* 1988). During our fieldwork, we saw vultures only once: a small flock of Rüppell's Griffon *Gyps rueppellii* between Kinzindi and Nguigmi on 22 Aug 2003. At Malamfatori, two African White-backed Vultures *Gyps africanus* and one Rüppell's Griffon were observed between 1997 and 2000 (Gustafsson *et al.* 2003). This suggests a large decline, in line with the findings of Thiollay (2006), who compared densities of raptors across W Africa in 1969–1973 with 2003–4 and found a 98% reduction in numbers. Bateleur *Terathopius ecaudatus* also seems to have declined greatly over the last three decades: P.J. Jones observed several between Maïné-Soroa and Diffa on 25 Feb 1975, and west of Maïné-Soroa and between Maïné-Soroa and Nguigmi on 24 Aug 1975 (Giraudoux *et al.* 1988, P.J. Jones pers. comm.). We never saw this species in SE Niger but it was observed twice in 2000 in neighbouring NE Nigeria (Gustafsson *et al.* 2003). The Secretary Bird *Sagittarius serpentarius* was “frequently observed near Nguigmi” (Rousselot 1947) and observed west of Maïné-Soroa on 12 Aug 1975 and south of Maïné-Soroa on 25 Dec 1977 (Giraudoux *et al.* 1988). We never saw this species in SE (or elsewhere in) Niger, and according to Thiollay (2006) it is probably now extinct in W Africa. The Marabou Stork *Leptoptilos crumeniferus* also appears to have declined much over the last decades. In Aug 1975 P.J. Jones observed several along the road between Maïné-Soroa and Nguigmi, and small flocks were present at Komadougou Yobé River in Dec 1978 (Giraudoux *et al.* 1988). The species was found breeding 54 km northwest of Nguigmi on 22 Aug 1975 just outside Zone 4 (Giraudoux *et al.* 1988). In the 1990s flocks of 10–20 were still observed annually between Maïné-Soroa and Diffa in Aug–Sep, feeding on grasshoppers with Abdim's Storks (Z. Ouambama pers. comm.). During our fieldwork we saw one only, on 26 Sep 2003. A few were observed in NE Nigeria in 2000 just south of the border (Gustafsson *et al.* 2003). This species is definitely much rarer now in SE Niger than just 10 years ago.

Proposal for new IBA

Brouwer *et al.* (2001) identified 15 Important Bird Areas (IBAs) for Niger. None includes the grasslands and wetlands of SE Niger. Based on the new knowledge of the avifauna, we propose that a new IBA be designated that encompasses the grassland and wetlands where the major concentrations of Abdim's Storks were located (Fig. 1). We also found this part of SE Niger to be especially important to several species of global conservation concern and for a number of species confined to the Sahel biome. The proposed IBA, the “Diffa-Kinzindi Grassland and Wetlands” meets the following criteria for qualification (as defined in Fishpool & Evans 2001):

A1. Six species of global conservation concern (<http://www.iucnredlist.org/> accessed Dec 2007) have been recorded at the site within the last 30 years: Rüppell's Griffon Vulture (Near-threatened), Beaudouin's Snake Eagle (Vulnerable), Pallid Harrier (Near-threatened), Lesser Kestrel (Vulnerable), Nubian Bustard (Near-threatened) and Black-tailed Godwit (Near-threatened). However, it is not known whether they are ever present in significant numbers.

A3. The site is known to hold a significant component of the group of species whose distribution is largely or wholly confined to the Sahel biome: 11 of the 16 species that occur in Niger have been recorded at the site. An additional species, Golden Nightjar *Caprimulgus eximius*, most likely occurs too, as it is known from Dilia de Lagané just north of the Diffa-Kinzindi grassland and wetlands (Brouwer *et al.* 2001) and has recently been recorded just across the border in NE Nigeria (Gustafsson *et al.* 2003).

A4iii. The site is known or thought to hold, on a regular basis, at least 20,000 waterbirds. Biologists studying grasshoppers in SE Niger since the mid-1990s have confirmed that flocks of Abdim's Storks of the same magnitude as in 2003 (where the numbers were estimated at 17,000), have been present annually from August to October for more than a decade. Also the very large numbers of Cattle Egrets observed in 2002, 2003 and 2005 are believed to be present every year and the combined number of Abdim's Storks and Cattle Egrets by far exceeds the 20,000 threshold.

Acknowledgments

We thank the staff at Agrhymet Regional Centre in Niamey, Niger, in particular Zakaria Ouambama, for important information on the birds of SE Niger and great company in the field. We also thank Knud Falk, Morten Møller Hansen, Marchel Rahner, Jan Fischer Rasmussen, Henrik Skov and Anders Tøttrup for help with the fieldwork and Christian Hjort for information on results of the Lake Chad Bird Migration Project at Malamfatori in NE Nigeria. Joost Brouwer is thanked for very valuable comments on an earlier version of this paper and for access to the information in the Niger Bird Database (NiBDaB). All data from the NiBDaB used in this paper were collected by Wim Mullié and he is thanked for permission to use this information. Peter Jones is thanked for helpful comments on the manuscript and for unpublished data from 1975. The fieldwork for this study was carried out as part of the Préliss project funded by DANIDA.

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The lowland raptor community of the Gamba Complex of Protected Areas, Gabon

by R. Buij

Monitoring and Assessment of Biodiversity Program,
National Zoological Park, Smithsonian Institution,
1100 Jefferson Drive SW #3123, Washington DC 20560-0705. U.S.A.

and

CML, University of Leiden, Institute of Environmental sciences,
POB 9518, 2300 RA Leiden, The Netherlands.

Received 19 May 2007; revised 15 November 2007.

Summary

Surveys were conducted in all major lowland habitats of the Gamba Complex of Protected Areas, Gabon, between June 2004 and January 2005, and in July 2006. Details of 23 raptor species are presented, including locally rare *Hieraaetus ayresii*, *Kaupifalco monogrammicus*, *Lophaetus occipitalis* and *Falco biarmicus*, information on the breeding cycle of several species, and records of the infrequently recorded Palearctic migrants *Pernis apivorus*, *Buteo buteo* and *Falco vespertinus*.

Résumé

Les rapaces dans les zones de basse altitude du Complexe d'Aires Protégées de Gamba, Gabon. Tous les habitats principaux de basse altitude dans le Complexe d'Aires Protégées de Gamba, Gabon, ont été explorés entre juin 2004 et janvier 2005, puis en juillet 2006. Une analyse est présentée de 23 espèces de rapaces, y compris les espèces localement rares de *Hieraaetus ayresii*, *Kaupifalco monogrammicus*, *Lophaetus occipitalis* et *Falco biarmicus*, ainsi que des informations sur le cycle de reproduction de plusieurs espèces et des observations sur des migrateurs Paléarctiques peu connus dans la région *Pernis apivorus*, *Buteo buteo* et *Falco vespertinus*.

Introduction

Information on raptor abundance and diversity in Central African forests is sparse. The Gamba Complex of Protected Areas covers approximately 10,000 km² on the SW coast of Gabon and is one of seven Important Bird Areas in the country (Christy

2001), although few publications are available on its avifauna (Sargeant 1993, Schepers & Marteiijn 1993, Christy 2001, Angehr *et al.* 2005). The Gamba Complex comprises diverse habitats (Christy 2001), suitable for a variety of raptor species. Angehr *et al.* (2006) noted 27 raptor species, based on surveys in 2001–3 and observations by Sargeant (1993). I present further information on the raptor community of the Complex, gathered during extensive surveys covering lagoons, rivers, forests, and coastal and inland savannas between June 2004 and January 2005, and in July 2006.

Study area and methods

A general description of the Gamba Complex (Fig. 1) was provided by Christy (2001). In 2002, the Loango and Moukalaba-Doudou protected areas were made National Parks. The Rabi-Ndongo Protected Area (RNPA) is a site of oil exploration but functions as a wildlife corridor linking the two National Parks (Buij *et al.* 2007). Large fluctuations in annual rainfall occur, from 1476 to 2861 mm between 1989 and 2004 (Shell-Gabon 2005). The 2004 data indicate a dry season from May to September and a wet season from October through April.

Surveys covered all important habitats in the Gamba Complex apart from the upland forest found in Moukalaba-Doudou NP, whose edges were surveyed by boat on the Ndongo River. The lowland areas surveyed were: the surroundings of Gamba town including the area between Gamba and Setté Cama (*c.* 300 km²); the RNPA between the oilfields of Toucan in the north and Koumaga in the south and Ngové and Ndongo Rivers on the W and E borders, respectively (*c.* 3500 km²); Loango NP (*c.* 1500 km²), both the south (Petit Loango) and the north (Iguela area) and river and lagoon systems bordering the Park. Sites are described in more detail in Angehr *et al.* (2005, 2006). Most time was spent in the RNPA, which was more widely and intensively covered than by Angehr *et al.* (2005), who surveyed only the Rabi-Toucan area in the north. The RNPA is characterised by upland forest on hilly terrain up to 150 m elevation, and seasonally inundated floodplain forest (De Bie & Geerling 1989, Prins & Reitsma 1989). Much of the forest in RNPA is mature secondary forest (De Bie & Geerling 1989), often with dense undergrowth. Oil and gas exploration and production concessions have led to increased accessibility, forest clearance for road and oil platform construction, and fragmentation of the habitat, although the human impact on the landscape is generally considered small at present (Thibault & Blaney 2003).

Roads were driven most frequently in the Rabi Oil Field (total *c.* 350 km) and between Rabi and Koumaga (total *c.* 2000 km), but also in other parts inside and just outside the RNPA, in the Gamba to Setté Cama area, and the N section of Loango NP between June 2004 and January 2005. Almost all roads in the RNPA were driven, most of them on multiple occasions. Three surveys on foot were conducted in six sites

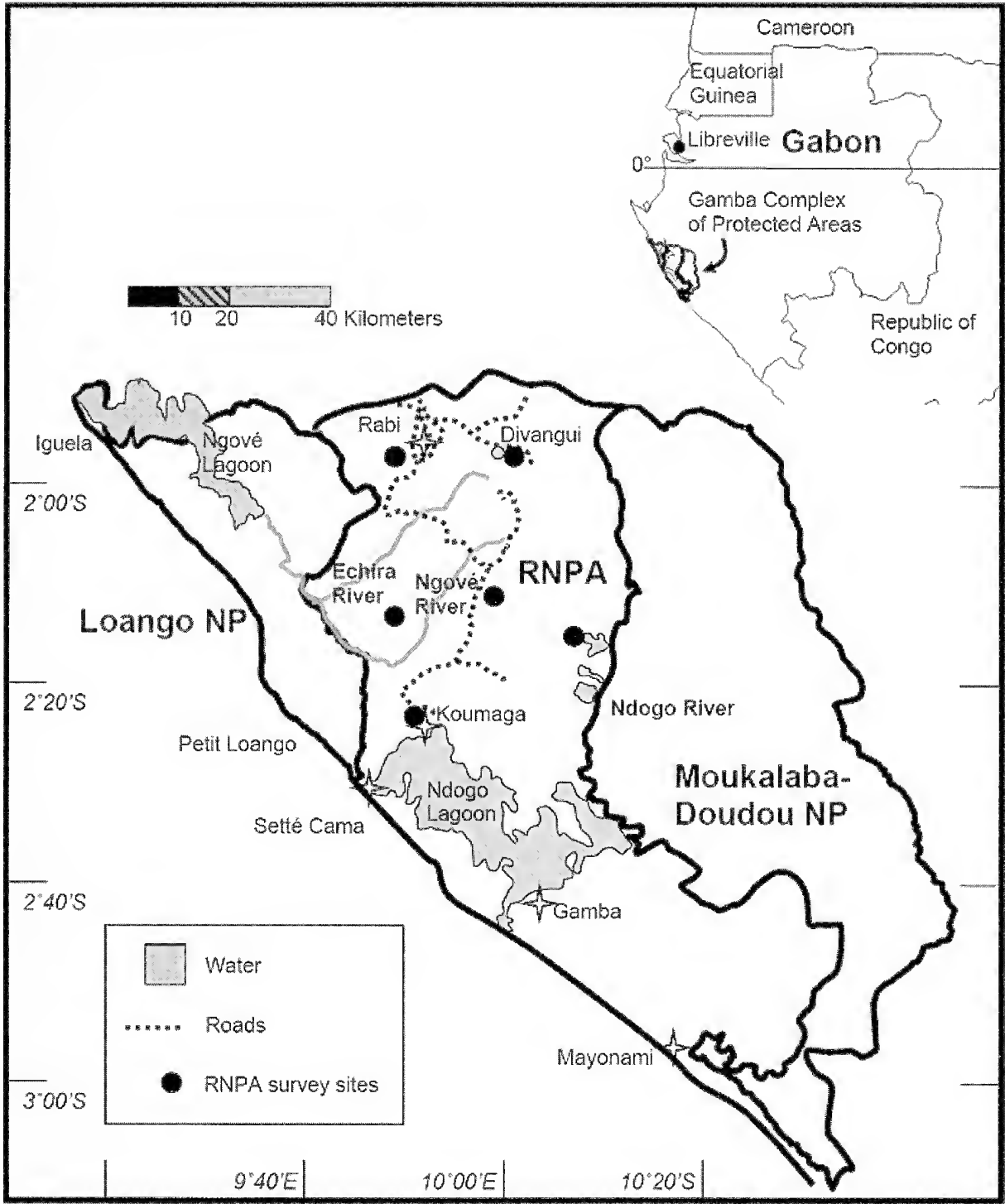


Figure 1. Gamba Complex of Protected Areas, with survey localities.

widely spaced in the RNPA (Fig. 1) between June 2004 and Jan 2005, to cover a large and representative section of the RNPA; an average of 73 km (25–115 km) was walked through the forest per site over a period of 4–7 days. The distance covered on roads in the RNPA was approximately twice the distance covered on foot. The Loango NP was surveyed on foot, by car and by boat on six occasions (Iguela twice,

Petit Loango four times). Surveys on foot were also conducted on trails bordering the Echira and Ngové rivers at the edge of the Loango NP. In July 2006, observations were made from roads in the Rabi area (c. 150 km) and the Gamba area. Survey time at different locations is indicated in Table 1.

Table 1. Total time spent at survey localities between June 2004 and July 2006.

Location	Days spent	Period
West RNPA	17	Jun, Sep, Dec 2004, Jan 2005
Ndogo River in RNPA	19	Jul–Aug, Nov 2004, Jan 2005
Koumaga in RNPA	25	Jul–Aug, Oct–Nov 2004, Jan 2005
Central RNPA	16	Jun–Aug, Oct–Nov 2004, Jan 2005
Lake Divangui in RNPA	9	Aug, Dec 2004, Jan 2005
Rabi in RNPA	87	Jun 2004 to Jan 2005, Jul 2006
Ngové River in Loango NP and RNPA	8	Aug–Sep 2004
Echira and Ngové Rivers in RNPA	8	Aug–Sep 2004
Ndogo Lagoon	8	Aug–Sep, Nov 2004 to Jan 2005
Gamba to Setté Cama area	31	Aug–Sep, Dec 2004, Jan 2005, Jul 2006
Loango NP (Iguela)	12	Sep–Oct 2004
Loango NP (Petit Loango)	17	Aug–Sep, Dec 2004, Jan 2005

Walks through the forest sometimes followed elephant trails, rivers, or old logging roads, and were mostly determined in advance to arrive at randomly generated GPS locations in each survey locality (Fig. 1). While most surveys in the forest were systematic and repeated, most surveys from roads and boats were opportunistic or to reach the forest survey sites. Frequent counts were made from vantage points outside the forest where possible. Roads were driven slowly (20–40 km/h), primarily in the morning. Observations from boats on the rivers, or by car or on foot in open areas were made in the morning or late afternoon. The coastal savannas were mostly surveyed on foot in the morning and late afternoon. Borrow & Demey (2001), Kemp & Kemp (1998), Chappuis (2000) and Ferguson-Lees & Christie (2001) were used for identification. All raptors observed are presented here.

Results

I recorded 23 raptor species in the Complex. Abundance is indicated as: common, 1–10 seen or heard in suitable habitat each day; frequent, often seen but not every day; uncommon, only a few records during the survey period, or restricted to only one or a few sites in the study area; rare, one or two records during the survey period. Records documented by photographs are indicated (p).

***Pandion haliaetus* Osprey**

Uncommon Palaearctic migrant along rivers, lagoons and the coast. Two above a large lagoon near Gamba and two above the Ngové River, in Aug 2004, were immatures probably spending the northern summer in the area. Between Sep 2004 and Jan 2005, one along the Echira River, two above the Ngové River at the edge of Loango NP, two at Petit Loango over the beach, two over the Ndogo River, three over the beach at Loango NP. [Observed along the coast, in Loango NP, Moukalaba-Doudou NP and Gamba (Schepers & Marteiijn 1993, Angehr *et al.* 2005).]

***Aviceda cuculoides* African Cuckoo Hawk**

Uncommon resident in RNPA. A pair carrying branches to a nest 30 m up a tall tree in Rabi, in a quarry area with grassy vegetation and surrounded by forest, 25–30 Oct 2004 (p). Nest building was most active in the early morning. In Nov, the pair was mating and displaying near the nest tree, and catching large insects in it. A pair was seen over a quarry in the north of Rabi, and one bird over the Ngové River. [Observed in Rabi-Toucan and Moukalaba-Doudou NP (Angehr *et al.* 2005), and Gamba (Sargeant 1993).]

***Pernis apivorus* European Honey Buzzard**

Frequent Palaearctic migrant, Nov–Jan. One flying over the coastal savanna in Loango NP, 15 Oct 2004. A total of 15, mostly juveniles, was seen throughout the corridor, 12 of them in the Rabi area, sitting on an oil pipe on the side of a road or on the road itself, or in the forest edge bordering a road or a river. [Gabon is part of the most significant winter quarters for the species (Ferguson-Lees & Christie 2001). Angehr *et al.* (2005) did not observe it in Rabi-Toucan in Feb–Mar 2002 but recorded several along the coast in Oct–Nov.]

***Macheiramphus alcinus* Bat Hawk**

Rare resident. One seen briefly flying low and fast over the forest canopy in the early evening, in the Rabi Oil Field, Oct 2004. [Few records throughout the corridor (Angehr *et al.* 2005).]

***Milvus migrans* Black Kite**

Rare Palaearctic or Afrotropical migrant. An adult over a small savanna area in dense forest in the Rabi area, 30 Oct 2004, is the first for RNPA. It was not identified to subspecies. More commonly seen along the coastline to the north. [Few records in the Gamba area (Sargeant 1993) and Loango NP (Angehr *et al.* 2005).]

***Haliaeetus vocifer* African Fish Eagle**

Uncommon resident. Recorded many times on the Echira River (two adults) and in Rabi (two adults, one juvenile). A total of 2–3 adult pairs on the Ngové and Ndogo Rivers. Single individuals repeatedly seen on the Ndogo Lagoon, and in Loango NP in a variety of habitats, including inland swamps, large rivers, and lagoons [Rare throughout Gamba Complex; uncommon in Rabi-Toucan (Angehr *et al.* 2005).]

***Gypohierax angolensis* Palm-nut Vulture**

Common resident on the Ndogo lagoon (often near raffia palms *Raphia*), along the Loango NP coast and along large rivers; less frequent in closed forest inland. Roosts in a Rabi swamp and near Koumaga had up to nine birds. Five nests observed, three

of them occupied Jun–Sep 2004 (p). Adults preying on African River Martin *Pseudochelidon eurystomina* and Rosy Bee-eater *Merops malimbicus* fledglings in Loango NP, Oct 2004. Several scavenging small fish near a small receding pond close to a Rabi well site, Jul 2006 (p). [Throughout Gamba Complex (Angehr *et al.* 2005).]

***Dryotrionchis spectabilis* Congo Serpent Eagle**

Uncommon resident in RNPA. Seven individuals observed, all singly, and others heard throughout the area, including at the edge of tall forest in the Rabi area (p), and near the Ndogo River. One flying fast through a patch of degraded forest with low secondary growth and human habitation, at the edge of primary forest just north of Loango NP. Calls heard in Echira, Rabi, and west of the Ndogo River. [Throughout the Complex but generally rare (Sargeant 1993, Angehr *et al.* 2005).]

***Polyboroides typus* African Harrier Hawk**

Uncommon resident. Frequent in the Rabi area (p) during the entire period, often near well sites, along roads and over quarries in the forest. Also three in Loango NP (two near African River Martin colonies), several times on the Gamba golf course and in the Gamba area. [Uncommon throughout (Angehr *et al.* 2005).]

***Accipiter tachiro* African Goshawk**

Subspecies *toussenelii* is an uncommon resident in RNPA. A juvenile hunting inside the forest near a bird party consisting mainly of Fire-crested Alethes *Alethe diademata*, in the central RNPA, Jul 2004. An adult flying over a forest road in Koumaga, Sep. One individual in the forest calling loudly and another arriving with a small green lizard in Rabi, Nov, suggests breeding. Display song was not heard. An adult in the same area in Dec. A confiding juvenile was seen perched in the forest edge along a busy road in Rabi (p), 6 m above the ground, Jul 2006. [Recorded in Gamba, Moukalaba-Doudou NP and Loango NP (Angehr *et al.* 2005).]

***A. castanilius* Chestnut-flanked Sparrowhawk**

Uncommon resident in RNPA. Seen in the corridor area 15 times between Jun 2004 and Jan 2005, and twice in Jul 2006, mostly birds flying over roads, typically 1–3 m above the ground (generally lower than *A. tachiro*), to land in dense forest cover at the edge of the road. Also observed perched in the open near roads in the Rabi (p) and central corridor areas, and hunting small birds near Echira, from cover near the forest edge. These observations conform to previous studies suggesting it relies on still-hunting and surprise flights from cover to catch birds (Brosset & Erard 1986). [Recorded in Loango NP, Moukalaba-Doudou NP and Gamba (rare) (Angehr *et al.* 2005).]

***A. erythropus* Red-thighed Sparrowhawk**

Rare resident. One flying over patch of grassy savanna surrounded by dense forest near Koumaga was chased by two Rufous-chested Swallows *Hirundo semirufa*, Sep. One hunting over the Gamba golf course, Jul 2006. [Rarely recorded in the Complex (Angehr *et al.* 2005).]

***A. melanoleucus* Black Sparrowhawk**

Rare resident. An adult seen diving several times at a Hamerkop *Scopus umbretta* in the Ngové River, near Akaka, Aug 2004. Another perched at the edge of the Gamba

golf course and subsequently hunting birds over a small stream. [Rare in the area (Sargeant 1993, Angehr *et al.* 2005).]

***Urotriorchis macrourus* Long-tailed Hawk**

Uncommon resident, widespread in RNPA. Adults heard and seen in the Rabi area eight times, Jul–Sep 2004 and Jul 2006. Most observed in the late afternoon when calling from the forest canopy and flying between perches. One calling near the forest edge in the Koumaga area, Sep 2004; a single bird near or on the road in the central RNPA, Oct, Dec; one flying low over the road near Divangui, Oct; a pair calling in tall primary forest west of Ndogo River, Aug; a juvenile calling in open riverine forest near the Ndogo River, Aug. An adult display-calling and gliding with stiff wingbeats in Echira, Dec, and begging juveniles Jul–Aug, suggest breeding during the second half of the wet season. Frequently hunts from the forest understorey (1–5 m from the ground) near roads. [Recorded in Gamba Sargeant (1993), and in Loango and Moukalaba-Doudou NPs (Angehr *et al.* 2005).]

***Kaupifalco monogrammicus* Lizard Buzzard**

Rare resident. An adult observed several times in a clump of small trees in a large quarry with grassland and scrub in Rabi, Nov 2004 (p). One close to the same site, Jul 2006. [Sargeant (1993) did not record it. Listed for the Gamba Complex IBA prior to 2001 (P. Christy *in litt.* to R.J. Dowsett pers. comm.). Observed once in Loango NP by Angehr *et al.* (2005).]

***Buteo buteo* Common Buzzard**

Rare Palearctic migrant. One circling above an African River Martin colony in the Loango NP coastal savanna, 15 Oct 2004. [Previously recorded during the northern winter in the Gamba area by Sargeant (1993) and Angehr *et al.* (2005).]

***B. auguralis* Red-necked Buzzard**

Rare resident. An immature seen on several occasions in a forest clearance in Rabi, Jun–Jul 2004 (p). A nest with a pair attending, in a large dead tree close to the forest edge bordering a large open savanna in the Gamba area, Aug 2004. The pair was still present in Jan 2005. [Rare throughout; previously unrecorded in RNPA (Angehr *et al.* 2005).]

***Hieraaetus ayresii* Ayres's Hawk Eagle**

Rare, presumed resident. Single birds observed on several occasions in the Rabi area, Jun, Nov 2004, Jul 2006, gaining height above a flare, circling above the forest, or roosting on a dead tree together with Palm-nut Vultures. [Gamba area only (Sargeant 1993).]

***Lophaetus occipitalis* Long-crested Eagle**

Rare resident. One perched in a patch of extensive swampy savanna along the Ngové River, Aug 2004; another flying over a road bordered by banana plantations in secondary forest northeast of Rabi, Jan 2005. [Listed only for the Gamba area (Sargeant 1993).]

***Spizaetus africanus* Cassin's Hawk Eagle**

Rare resident. An adult perched 15 m up a large tree close to a heavily used road in the north of Rabi, Jun 2004 (p). An adult in the same area, Oct 2004. Other adults were seen perched near the Rabi-Divangui road, Oct, Jan, one being mobbed by two Great Blue Turacos *Corythaeola cristata*. Two adults calling and displaying 100 m

above the canopy in the central RNPA, 20 Oct. Display consisted of a series of deep dives on closed wings interspersed with upward swoops on spread wings, accompanied by loud “keeyep” calls, and circling with wings held in a deep V. An adult circling above the riverine forest bordering the Ndogo River, Aug; one flying fast and low over the canopy at the edge of an open savanna close to the Echira River, Oct. Observations suggest at least 4–5 pairs in RNPA, but probably more given its inconspicuousness and the large areas of suitable habitat not investigated. [Recorded in the Gamba area (Sargeant 1993); rare in the Moukalaba-Doudou area (Angehr *et al.* 2005).]

***Stephanoaetus coronatus* Crowned Eagle**

Frequent resident. Two pairs often heard and seen in and near Rabi. Display flights were most common during the start of the rainy season (Oct–Dec), but birds were heard throughout the survey period. Other pairs heard and observed in forest in the central RNPA, near Echira River, at Lake Divangui and in Loango NP. One perched near the forest edge was mobbed by Putty-nosed Monkeys *Cercopithecus nictitans*. Another seen sitting on the Rabi-Koumaga road. A juvenile was calling loudly for an extended period from the forest edge in the central RNPA, Oct (p). [Rare outside Rabi-Toucan (Angehr *et al.* 2005).]

***Falco vespertinus* Red-footed Falcon**

Palearctic vagrant. A second-year male perched in isolated trees and hovering over the central savanna of Loango NP, 9 Oct 2004. Second record for coastal Gabon and fourth in Gabon (Sargeant 1993, Christy 2001, Borrow & Demey 2001). [Previously recorded by Sargeant (1993) in the Gamba area.]

***F. biarmicus* Lanner Falcon**

Rare resident. An adult and a juvenile together in trees and circling above the S coastline of Loango NP (Petit Loango), 23 Dec 2004. A juvenile, possible the same bird, was seen several km northwest of Setté Cama a few days later. [Absent from the equatorial rainforest zone but found in open areas along Gabon’s coastline (Christy 2001). Recorded in the Gamba area (Sargeant 1993).]

Discussion

The timing and duration of visits, and the habitat covered, are important factors when surveying raptors, and this is particularly true for rainforest habitats (Thiollay 1975). Since these surveys were conducted in habitats with different visibility, it is difficult to draw firm conclusions on the relative abundance of species. Since most time was spent in the forested RNPA, several open area species previously recorded by Sargeant (1993) and Angehr *et al.* (2005) in the Gamba area were missed: Common Kestrel *Falco tinnunculus*, Peregrine Falcon *F. peregrinus*, Black-shouldered Kite *Elanus caeruleus* and Eurasian Marsh Harrier *Circus aeruginosus*. Cassin’s Hawk Eagle, Long-tailed Hawk, African Goshawk, Chestnut-flanked Sparrowhawk, Red-thighed Sparrowhawk, and perhaps Congo Serpent Eagle may be more common than

observations suggest. Even in the Rabi area, which was most intensively surveyed, these forest raptors were only recorded at intervals of several weeks or even months, while they were probably present throughout the survey period.

All forest species were observed hunting, sitting near, or flying over forest roads, some almost exclusively so (*e.g.* Chestnut-flanked Sparrowhawk, Long-tailed Hawk, Cassin's Hawk Eagle). Although raptors are more likely to be detected in open areas, the great difference in observation frequency along roads and in forests might suggest that forest edges function as important hunting grounds for some species. Several raptors observed for the first time in the industrially exploited RNPA, such as Lizard Buzzard, Red-necked Buzzard, Ayres's Hawk Eagle, and Long-crested Eagle, may profit from forest clearance. Other species often cited as forest dependant, notably Congo Serpent Eagle, Cassin's Hawk Eagle, Long-tailed Hawk, and Crowned Eagle, were regularly seen in mature secondary forest but not away from large forest blocks. Congo Serpent Eagle and Cassin's Hawk Eagle were, however, recorded in heavily degraded forest near human habitation. Elsewhere in west-central Africa, Crowned Eagle and Cassin's Hawk Eagle appear to survive in open-canopy forest, while Congo Serpent Eagle and Long-tailed Hawk can be found near forest edge and even in farm-bush (in Sierra Leone, Ghana, Cameroon, Congo: F. Dowsett-Lemaire & R.J. Dowsett pers. comm.). Although it is not known whether such birds represent stable populations or temporary immigrants from forest areas, the frequency and spatial extent of these observations suggest that limited human impact on the forest landscape, such as in the Gamba Complex, may not necessarily affect the raptor community in a negative way and may benefit some species, as has been observed elsewhere (Thiollay 2000), however, further large-scale loss of forest cover in the RNPA is expected to threaten particularly its forest raptors.

Acknowledgments

This research was supported by the Smithsonian Institution Monitoring and Assessment of Biodiversity (SI-MAB) program, the Shell Foundation and Shell Gabon. I thank F. Denelle and F. Bangole of Shell Gabon and their staff in Gamba and Rabi for their generous assistance. F. Dallmeier, A. Alonso, P. Campbell, and T. Pacheco of SI-MAB organized and administrated project activities. Special thanks to Barbara Croes and Michelle Lee for all their help with field work, and Jean-Marc Thiollay, Robert Dowsett and one anonymous referee for comments on the draft.

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Great Blue Turacos *Corythaeola cristata* eating filamentous algae in Gabon

by Christelle Faure¹, Fiona Maisels² & Patrice Christy³

¹14, rue Blaise Pascal, 31850 Montrabe, France. <f-chris@hotmail.fr>

²Wildlife Conservation Society, BP 7847, Libreville, Gabon. <fmaisels@wcs.org>

³BP 2240, Libreville, Gabon

Received 23 August 2007; revised 30 September 2007

Summary

In the past, feeding on filamentous algae by the Great Blue Turaco *Corythaeola cristata* was thought to be relatively rare. At a swampy clearing in Gabon, a group of Great Blue Turacos regularly consumed filamentous algae for up to 1 h at a time, on over half of the 26 days that observers were present at the clearing. This behaviour may supply important amounts of protein and/or sodium to the birds' diet.

Résumé

Touracos géants *Corythaeola cristata* se nourrissant des algues filamenteuses au Gabon. Auparavant, le fait pour le Touraco géant *Corythaeola cristata* de consommer des algues filamenteuses était considéré comme relativement rare. Dans une clairière marécageuse au Gabon, un groupe de Touracos géants consommait régulièrement des algues filamenteuses, la prise alimentaire durant jusqu'à une heure, et ceci pendant plus de la moitié des jours de présence des observateurs. Ce comportement est susceptible d'apporter des quantités importantes de protéines et/ou de sodium dans la nourriture des oiseaux.

Introduction

Great Blue Turacos *Corythaeola cristata* have long been recognized as the most folivorous of the turacos. Up to 25% of their diet was composed of leaves in the Nyungwe National Park, Rwanda (Sun 1995, Sun & Moermond 1997), where they were occasionally observed feeding on aquatic plants, including algae (Sun *et al.* 1997).

In Central Africa, swampy clearings dominated by sedges and grasses (*baïs*) are relatively widespread. Some of these clearings are also mineral-rich, attracting large

mammals and birds, which feed on both the soil and the nutritious vegetation (Klaus-Hugi *et al.* 1998, Magliocca & Gautier-Hion 2002, May 2004, Ruggiero & Eves 1998). Filamentous green algae are common in the water of small ponds and streams within these clearings (Ruggiero & Eves 1998), their growth probably encouraged by the droppings and urine of the large mammals frequenting such sites.

Since the mid 1990s, a number of *baïs* have been studied in Central African Republic, Republic of Congo, Cameroon, and Gabon. The objective is usually research and monitoring of the large mammals using these sites. Observations are often carried out from a raised platform at the edge of the clearing, which provides the opportunity for recording behaviour otherwise rarely seen (*e.g.* Maisels 2003). Great Blue Turacos were seen feeding on the ground in marshy areas of similar clearings in the Republic of Congo (in Odzala NP, at the clearing known as “Moba” in September 1996) and in the Central African Republic (in Mongambé clearing in the Dzanga NP, in January 2000). On the first occasion they were clearly feeding on aquatic algae, and were probably doing so on the second. Here we present evidence that algae-feeding can be an important daily activity and, by implication, provide an important dietary component.

Methods

A small forest clearing “Djidji Bai”, in central Gabon (0°10.618'S, 12°21.983'E) was monitored for wildlife visits between May and July 2007. The clearing is *c.* 150 m across, dominated by sedges and grasses, and has a small, clear-water stream running along one side. A wooden platform, built at the edge of the clearing and immediately over the stream, affords excellent views.

Data were collected over a period of 26 days. Observations were made between *c.* 5h50 when it became light enough to see, until nightfall (between 18h30 and 19h00, depending on cloud cover). Total observation time was 133.5 h, (mean 5.1 h per day), of which *c.* 71 h were in the mornings and 63 h in the afternoons.

Results

A group of up to five Great Blue Turacos was regularly seen at the clearing, feeding on the filamentous green algae growing in the stream below the platform. The birds were only *c.* 15 m from the observers and could be clearly seen (Fig. 1). Fallen dead branches offered perching posts immediately above the water. They fed while standing in the running water, occasionally jumping onto dead branches to perch. We assume the turacos were the same individuals each time, as they are known to live in groups within a large home range (Sun & Moermond 1997), but of course without individually ringing the birds we cannot be certain of this.

The turaco group visited the *bai* on 15 of the 26 observation days and was present for a mean of 36 min. per observation day or 11% ($\pm 4\%$, 95% confidence limits) of the daylight time that the clearing was under observation. They spent long periods (range 3–60 min.; mean 20 min.) feeding on algae in the stream, comprising 78% of the total time that they were visible, and the rest of the time perched on branches. Feeding on algae comprised an average of 9% of the time the clearing was under observation per day. These are minimum figures, as they do not include feeding (or other) activity carried out whilst out of sight of the viewing platform. The birds were not seen to feed on anything else whilst in the clearing, but after feeding on algae, they usually flew across the clearing and vanished in the forest opposite the platform.



Fig. 1. Three Great Blue Turacos feeding on algae (dark patches in birds' shadows) below the viewing platform, Djidji Bai, June 2007. Photo: Prosper Motsaba. Colour photo may be seen at <http://malimbus.free.fr/suppindex.htm>.

Discussion

Brosset & Fry (1988) reported Great Blue Turacos feeding beside streams, apparently based on Malbrant & Maclatchy (1949). Gabonese hunters had reported to Malbrant

& Maclatchy (1949) that the species fed on green algae growing in pools of stagnant water. Fifty years later Rwandan hunters also reported this behaviour in clear or slow-flowing streams (Sun *et al.* 1997). Hunters in both countries said that they set traps specifically to catch them at these sites. Sun and his colleagues only rarely recorded this behaviour, because they were following focal birds to quantify their diet. Access to the narrow forest streams in which the aquatic plant-eating occurred was difficult in Rwanda, which the authors acknowledged caused a low estimate of the importance of aquatic plants to the birds' diet (<1%: Sun 1995). Our data show that this behaviour may be much more important than previously realised. Like Sun, we used the time allocated by birds to feeding on each food type as a proxy for intake, and we observed feeding on algae for 9% of the daylight hours sampled. We do not know the proportion of each day actually spent feeding and how much time is spent on other activities, but the daily time allocation to feeding on all types of food by two other species of turaco in Rwanda was only 8–15% (C. Sun unpubl. data, *in* Sun & Moermond 1997). If Great Blue Turacos spend up to 20% of their day actually feeding and if these were the same individuals each time, then clearly filamentous algae are a very important part of the diet, probably throughout the species' range. The behaviour has now been recorded in Rwanda, Central African Republic, Republic of Congo and Gabon.

Filamentous algae are known to be relatively rich in protein and minerals (Khan *et al.* 1996, Nwadiaro *et al.* 1990). The aquatic plants consumed by Great Blue Turacos (which included filamentous algae) analysed by Sun *et al.* (1997) were significantly richer in sodium than their two most important terrestrial leaf diet items. The ingestion of aquatic plants was hypothesised by the authors to be a way of detoxifying the leaves that they also consume: a common strategy in mammals (Kreulen 1985, Klaus-Hugi *et al.* 1998). This certainly seems to be the case for African Elephant *Loxodonta africana* (Houston *et al.* 2001), Black-and-white Colobus monkeys *Colobus guereza* (Oates 1978), and even mice (Freeland *et al.* (1985). Other detoxification methods used by birds were discussed by Diamond *et al.* (1999). In general, aquatic plants are richer in sodium than terrestrial leaves, and sodium content has been shown to be a significant parameter in choice of aquatic herbs by large herbivorous mammals (Belovsky 1981, Oates 1978, Stark 1986, Tracy & McNaughton 1995). However, filamentous algae are also usually richer in protein and lower in lignin than terrestrial leaves, and this may be another reason why turacos fed on algae. Sun *et al.* (1997) suggested otherwise, but this was partly because they thought that algae comprised a small part of the diet, and also because there were no great differences in either nitrogen or fibre content between the leaves eaten and those not eaten by this species. Analysis of filamentous algae from a small lake in N Congo (F. Maisels unpubl. data), showed that they contain *c.* 11% protein, with similar sodium concentrations to those found by Sun *et al.* (1997). Thus the birds may indeed be using the algae for protein as well as for sodium.

Acknowledgments

Many thanks to the Conseil National des Parcs Nationaux and the Ministère des Eaux et Forêts, both of the Government of Gabon, and to the Rougier Group. We are grateful to Prosper Motsaba (WCS Gabon) for his great help at Djidji. Finally enormous thanks to Nigel Orbell (WCS Gabon) without which the project would not have taken place, and to the Faure family for their moral and financial support.

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Short Notes — Notes Courtes

Reichenbach's Sunbird *Anabathmis reichenbachii* a new Benin record, and other interesting coastal observations

The Republic of Benin has not been surveyed for avifauna as well as its neighbouring countries. A total of 423 birds have been recorded from Benin (112,622 km²; Dowsett 1993) compared to 625 (Check & Walsh 1996) for Togo, its smaller neighbour (56,785 km²) with almost identical habitat zones, in part because Benin lacked resident ornithologists until the last 20 years.

I observed the following species during a U.S. military humanitarian mission to Cotonou and Ouidah, Benin, 2–17 September 2006.

***Falco naumanni* Lesser Kestrel.** I observed one individual in flight just outside the entrance to the Forest of Krath in the town of Ouidah, on the afternoon of 10 Sep. In flight, it seemed the size of a large dove or pigeon, with the tapered wing of a falcon. It had clean whitish wings with a little spotting and no barring, as viewed from below. The body was contrastingly darker, and the tail was long and somewhat rounded. The habitat was mostly open with large scattered tree clumps on the outskirts of habitations and cultivated land. I also observed two more individuals, one male and one of unidentified gender, perched in a stand of tall trees and in flight at the military base at the international airport in Cotonou, 13 Sep. I first saw the male perched and again noted the small size, reminiscent of American Kestrel *F. sparverius*, which is much smaller than Common Kestrel *F. tinnunculus*. I watched it fly from the tree and again noticed the falcon wing profile, underpart coloration, grey cap, rufous chest and belly, and the grey, rounded tail with black horizontal band. The tips of the underwings were black. I saw another bird perched or flying near this male several times in the next hour, which was the same size, similar in colour, and seemed to communicate with the male.

During the same period, I saw at least three Common Kestrels, which were significantly larger and darker underneath, with barred or streaked wings and chest. They also had distinctly square tails versus the more rounded Lesser Kestrel tail.

All published records of Lesser Kestrels in Benin are from the north. They are not uncommon in Park W from January to March (Koster & Grettenberger 1983). Green & Sayer (1979) recorded them from December to April in the Pendjari and Arli National Parks. Lesser Kestrels have not been recorded in Togo (Cheke & Walsh 1996), but are uncommon in N Nigeria according to Elgood *et al.* (1994).

***Columba guinea* Speckled Pigeon.** I observed one individual in Cotonou on a rooftop adjacent to the Chant d'Oiseau convent on 6 Sep. From about 20 m, it was obvious that the bird was a dove with unique reddish patterns. The large red circular patches

were quite distinct through binoculars, the neck exhibited numerous vertical reddish streaks, and the wings were also red with white spots. This species has been reported extensively in the north (Green & Sayer 1979, Koster & Grettenberger 1983, Borrow & Demey 2004), but only rarely in S Benin (Bouet 1914, Brunel 1958).

***Anthreptes gabonicus* Brown Sunbird.** I observed half a dozen or more individuals, usually solitary, on several occasions throughout the two-week period at La Casa del Papa Hotel on the coast, 5 km west of the old slave port in Ouidah. I first viewed a few individuals on independent occasions in coconut palms *Cocos nucifera* on the hotel grounds adjacent to a large mangrove lagoon. The small brownish silhouette resembled a warbler, with the white eye-ring boldly standing out against the drab brown of the bird's back. The black beak was thin, longer than a warbler beak and slightly bent. I subsequently observed other individuals from a kayak in mangroves along the shoreline, also in the Casa del Papa vicinity, and took several photographs. Sinsin (1995) reported Brown Sunbirds in the Lama Forest in S Benin. They are common on the coast of Nigeria in mangrove habitat (Elgood *et al.* 1994), but no records exist for Togo (Cheke & Walsh 1996).

***Anabathmis reichenbachii* Reichenbach's Sunbird.** I observed one adult male in a coconut palm at a beef and coconut farm on the outskirts of Ouidah, 11 Sep. It was a large sunbird with a vivid iridescent blue head and a comparatively drab olive-green back. The bill was black, thin and sickle-shaped. Reichenbach's Sunbird has not been previously recorded in Benin, although it is uncommon in neighbouring Nigeria (Elgood *et al.* 1994) and was most likely observed by Millet-Horsin (1924) in coastal Togo, near Anecho.

***Ploceus aurantius* Orange Weaver.** I observed and photographed from a kayak a small colony of both sexes in a patch of mangrove trees, late in the afternoon on 11 Sep. The colony was hidden in a large lagoon away from the shoreline c. 0.5 km from La Casa del Papa Hotel. It contained half a dozen or more nests. The male had a distinctly clean and rather bright orange head, with only a thin stripe of black running from the beak to the eye. The body was a dull green with some yellow underneath. All other male weavers in the area had far more black on their faces and body. The nest had a short, tube-like opening which looked almost cut off at the top. The Orange Weaver nest was the only choice on the weaver nest plate in Borrow & Demey (2004) that matched. Millet-Horsin (1924) reported Orange Weavers as common in mangrove habitat at Anecho in nearby Togo, but Benin records include spring sightings only on the Ouémé River in the northwest (P.M. Claffey pers. comm.).

Brown Sunbirds and Orange Weavers have each been reported only once in Benin (Sinsin 1995, P.M. Claffey pers. comm.). Reichenbach's Sunbird is a new species for the country. These three species may be more common than previously thought. Their ranges extend along the coast of countries on either side (Borrow & Demey 2004) and Benin contains appropriate mangrove or coastal scrub habitat along the same linear belt. There are no published records of Lesser Kestrels in S Benin and Speckled

Pigeons have been recorded rarely in the south (Bouet 1914, Brunel 1958). These observations confirm a need for further surveys in Benin, suggested by Holyoak & Seddon (1989) and Dowsett (1993).

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Received 2 March 2007; revised 27 August 2007.

Landon Jones

Department of Plant and Wildlife Sciences, Brigham Young University, 136-WID,
Provo, UT 84601, U.S.A. <lrj6@byu.net>

Lipid metabolite levels among pre-migratory Palaearctic songbirds during the wet–dry season transition

The significance of the rate of fat deposition prior to migration has long been recognised, particularly in relation to songbirds preparing to cross the Sahara (Smith 1966, Fry *et al.* 1970). Based on trends in mean weight in pre-migratory populations, I recently speculated that fat deposition proceeds more slowly in dry than in wet season conditions, and that this in turn has a critical influence on the migration patterns of many trans-Saharan migrants (Bell 2006, 2007). The main drawback of these studies is that measures of mean weight in a population are subject to many sources of bias. A more reliable source of evidence would be provided by comparisons based on estimation of individual fattening rates, as indicated by the level of triglyceride in blood plasma (Jenni-Eiermann & Jenni 1994). A small number of blood samples of songbird migrants, taken during the dry-wet season transition period in central Nigeria, provide an opportunity for a preliminary investigation along these lines.

Blood samples were taken from Palaearctic migrants mist-netted in the grounds of the National Veterinary Research Institute on the Jos Plateau in central Nigeria (9°43.7'N, 8°47.1'E), between 25 Mar and 12 Apr 2007. Fat score was also recorded using a standard eight point scale (Bairlein 1995) to assess how far fattening had progressed in each bird. Nets were kept under constant surveillance and the interval between a bird entering the net and the taking of a blood sample (bleed time) recorded. Blood was obtained by brachial venipuncture, and the samples centrifuged at 2000 g for 10 min. Plasma triglyceride was then assayed using an Ultrospec 4000 Spectrophotometer following a standard test procedure (Serum Triglyceride Determination Kit: Sigma Product code TR0100).

Twenty trans-Saharan migrants of six species were sampled during the period 1–5 h after local sunrise, and estimates of plasma triglyceride concentration were obtained from 14 birds of five species. The results show increases in both triglyceride levels and fat score (Fig. 1, Table 1), with a possible accelerating rate of triglyceride level after heavy rain on 3–4 Apr. Bleed time varied between nine and 35 minutes, and triglyceride may have declined with increasing bleed time (Table 1), perhaps due to capture stress or short-term fasting (Guglielmo *et al.* 2002). No significant effect of species or time of day was detectable for either fat or triglyceride (Table 1).

The beginning of the rainy season on the Jos Plateau marks an abrupt transition for resident birds, many of which begin to breed, and for Palaearctic migrants preparing for the trans-Saharan leg of their northern migration. Very little rain falls between October and March, generally broken in early April by heavy thunderstorms over a few days (Smith 1966, Bell 2007). At Vom in 2007, a 10-minute shower on 3 Apr was followed by periods of heavy rain lasting > 1 h on each of the following four days (Fig. 1). Following the first of these heavy showers in the early afternoon of 4 Apr, alate termites emerged in large numbers and many species switched to flycatching, even species ill-suited to this foraging mode, such as African Thrush *Turdus pelios*.

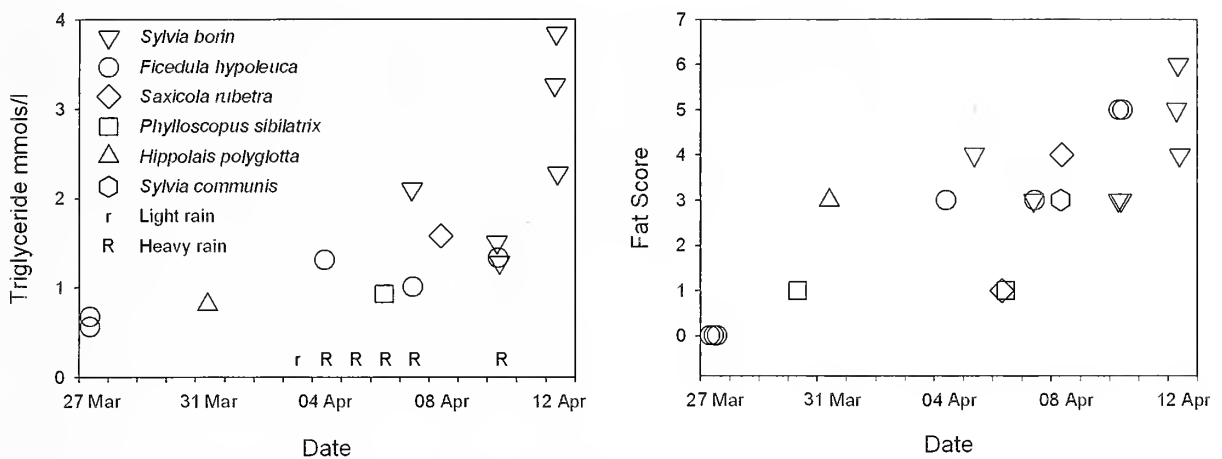


Figure 1. Plasma triglyceride concentrations and fat scores among Palaearctic songbird migrants at Vom, Mar–Apr 2007.

Palaearctic migrants were relatively scarce prior to the rains, with only six birds entering the mist-nets in 10 days up to and including 4 Apr, but became much more numerous afterwards, with 14 caught in the subsequent eight days (scaled deviance of daily frequency, before vs after rains = 3.93, $P < 0.05$, using Poisson errors and \log_e link). This corresponds with the observations of Smith (1966), who found that species such as Garden Warbler *Sylvia borin*, Pied Flycatcher *Ficedula hypoleuca* and Whinchat *Saxicola rubetra* occurred at Vom in small numbers throughout the winter, but appeared in larger numbers in April each year. It is likely that this annual influx reflects a tendency for birds that pass most of the winter further south to follow the rain front north to fatten for migration on the insect outbreaks that occur when the front reaches areas with a lengthy dry season.

Many of these birds may have already accumulated some fat further south, and the Vom birds with significant fat deposits prior to the rains may conceivably be early arrivals. Whether these birds were local winterers or not, the low triglyceride levels

Table 1. Analysis of covariance of plasma triglyceride concentration and fat score. Triglyceride analysis uses a \log_e link function and gamma errors, fat score normal errors and identity link. All analyses were carried out using Glim (Crawley 1993).

	Triglyceride					Fat Score				
	DF	SS	F	P	Value	DF	SS	F	P	Value
Error	6	0.397				11	12.533			
Species	4	0.186	0.704	0.617		5	6.099	1.071	0.427	
Bleed time (min.)	1	0.428	6.474	0.043	−0.039	1	1.037	0.910	0.361	
Time of day	1	0.0423	0.639	0.844		1	0.414	0.362	0.559	
Date	1	0.526	7.946	0.030	0.053	1	33.44	29.359	0.0002	0.274

exhibited prior to the first rainfall suggests that fat was being accumulated locally at a slow rate, only increasing after the appearance of termites and general increase in insect activity. It could be concluded from this that the beginning of the rains stimulates migrants to begin fattening in earnest. However this would mean that they either fatten at a slower than achievable rate prior to the rains, which is unlikely if the birds are following a time minimisation strategy (Alerstam & Lindström 1990), or that slow fattening reflects constraint by food shortage. After the rains, by contrast, the concentration of plasma triglyceride in Garden Warblers reached levels comparable with pre-migratory birds of the same species fed *ad libitum* in the laboratory (Jenni-Eiermann & Jenni 1994). This also corresponds to the findings of Smith (1966), that weights of migrants at Vom were lower at equivalent dates during a year when rains occurred later than usual.

Ottosson *et al.* (2005) present evidence that Garden Warblers are generally absent from further north in W Africa during the spring migration period, and suggest that they select more wooded areas well south of the desert from which to depart on the trans-Saharan leg of migration. However habitat may be less relevant than food availability in relation to the timing of migration. For species like the Garden Warbler, which have a relatively late spring migration, the latitude reached by the rain front in early April may define both the optimal latitude for pre-migratory fattening, and the northern limit of the wintering range. For earlier departing species and populations, the food glut accompanying the beginning of the wet season in the south of the W African savanna belt occurs too late, and the need to minimize the cost of migration therefore leads to winter occupation and pre-migratory fattening in areas well to the north.

Thanks to David Shamaki and the staff at the National Veterinary Research Institute, Vom, for excellent facilities and hospitality during the fieldwork, and special thanks to Bitrus Yakubu for advice and assistance during lab analyses. Thanks also to Chris Guglielmo, Lukas Jenni, Daphne Green and Sebastien Regnaut for advice on the use of triglyceride assay, and to the reviewers of an earlier draft of this paper for their useful comments.

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Received 9 July 2007

Revised 10 December 2007

Christopher Paul Bell
Conservation Programmes, Zoological Society of London,
Regent's Park, London NW1 4RY, U.K. <chris.bell@zsl.org>

Low altitude sightings of the Gulf of Guinea Thrush *Turdus olivaceofuscus xanthorhynchus* on Príncipe Island

Príncipe Island, with an area of 139 km², lies 220 km from the African coast and 146 km north of São Tomé Island, in the Gulf of Guinea (Fig. 1). Príncipe comprises a flatter region in the north, where the majority of the human population live and agriculture is common, and a more mountainous region in the centre and south of the island, with the highest mountain, Pico do Príncipe, reaching 948 m. Significant areas of primary rainforest remain only in the south, totalling c. 50 km² (Christy 2001). As one of the Gulf of Guinea islands, Príncipe is part of a globally important area of avian endemism (Jones 1994, Bibby *et al.* 1992, Fishpool & Evans 2001).

The Gulf of Guinea Thrush *Turdus olivaceofuscus* is endemic to São Tomé and Príncipe, with a separate subspecies described for each island. On São Tomé, *T. o. olivaceofuscus* is relatively widespread and common, being present almost wherever there is tree cover, from primary rainforest to urban gardens (Jones & Tye 2006). However, the species has been listed as Near-Threatened (IUCN 2006) as the Príncipe subspecies *T. o. xanthorhynchus* has been recorded on only a handful of occasions, and its status is unclear. One specimen collected in 1901, four in 1928, a photograph in 1997, one or two unpublished reports, and several unsuccessful expeditions to find

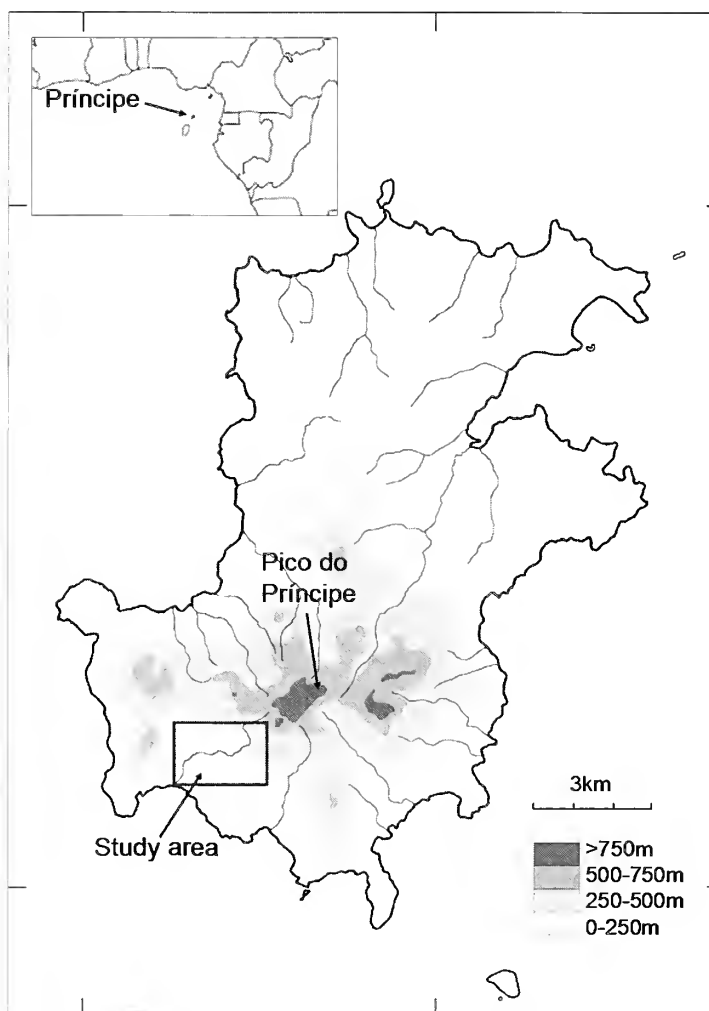


Figure 1. Map of Príncipe, showing altitudinal bands and the location of the study area (adapted from Jones & Tye 2006).

it, illustrated that the subspecies had never been widespread and was likely restricted to the remaining primary rainforest in the south of the island (Jones & Tye 2006). In 1999, J.M. Baillie (unpubl.) spent six weeks on the island, and observed several thrushes in primary rainforest from 290 to 750 m, especially around Pico do Príncipe and A Mesa, including four in a single day, and found them relatively tame and approachable. However, he observed only two during several days in lowland (10–250 m) forest in the southwest, along Ribeira de São Tomé. Here we report 12 observations of the thrush in lowland primary rainforest, in the region of Ribeira de São Tomé in January 2002.

We undertook 59 point counts in the lowland primary forest of SW Príncipe, near Ribeira de São Tomé (Fig. 2), during the mornings of the 19–24 Jan 2002 (Dallimer & King in press). The Gulf of Guinea Thrush was registered during six (10 %) of the point counts, always singly, and was present at a further six locations. On the first morning, it was recorded four times in 3 h. It was recorded at altitudes of 100–210 m, on valley floors and at ridge tops. On all occasions, the thrush was seen at low to mid

positions in the forest. Canopy height ranged from 20 to 33 m. The thrush was curious and unafraid, and allowed a close approach without it seemingly being disturbed. It was obviously smaller than the São Tomé subspecies, with a weaker, less penetrating voice and call. We clearly saw the yellow bill, pale legs and larger, darker breast and belly bars, which distinguish the Príncipe subspecies. The thrush was not caught during 35 mist-net hours (King & Dallimer 2003), nor seen during visits to surrounding areas of overgrown secondary forest to the west and south of A Mesa and Praia da Nova. Subsequent low altitude records (at c. 150 m) include regular sightings in the area of Ribeira Porco, where an individual was mist-netted in December 2003 (M. Melo & M. Fernandes *in litt.*).

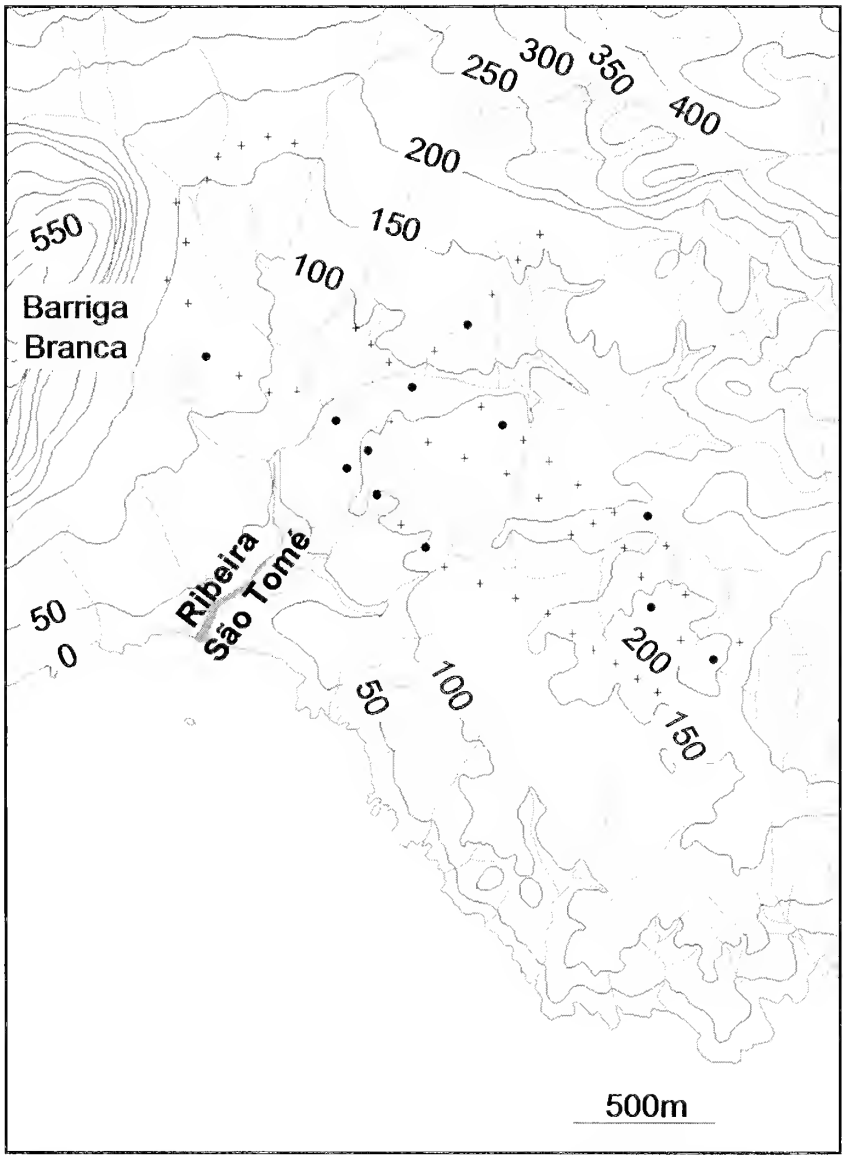


Figure 2. Location of 59 point count sites in lowland primary forest around Ribeira de São Tomé, Príncipe, showing presence (dots) and absence (crosses) of *Turdus olivaceofuscus xanthorhynchus* (coastline, watercourses and contours in metres © A. Gascoigne, M. Koo & T. Wojciechowski).

T. o. olivaceofuscus on São Tomé is bigger, with a fuller, richer song, and is noisy and common, contributing the major part of the early dawn chorus. We saw it at 33% (31 of 93) of our lowland primary rainforest point count locations on São Tomé (170–540 m altitude), and heard it at a further 8%. It was also recorded regularly in montane and mist rainforest, and was one of the most frequently netted species in primary forest on the island (King & Dallimer 2003).

The Príncipe bird is currently regarded as an endemic subspecies. However, descriptive accounts (*e.g.* Clement *et al.* 2000, Jones & Tye 2006) and recent morphological and genetic evidence (Melo 2006) suggest that it should be afforded full species status. Our observations support the noticeable differences between the two subspecies in morphology, song and abundance. There is also a need to establish the exact distribution of the Príncipe thrush, to estimate its population size, and to reinforce the proposed conservation programme for the remaining primary rainforest of this unique island.

We thank the staff of ECOFAC São Tomé and Príncipe for their help in carrying out the fieldwork. Manuel Borge Jiana was our guide on Príncipe and we also thank Angus Gascoigne, Peter Jones, Rachel Atkinson and Martim Melo for logistical support, comments and discussions. The work was funded by the Davis Expedition Fund, the British Ecological Society and the John Ray Trust. Additional support was provided by Garmin (Europe) Ltd and Berghaus Ltd.

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Received 15 September 2007

Tony King¹ & Martin Dallimer²

¹The Aspinall Foundation, Port Lympne Wild Animal Park,
Hythe, Kent CT21 4PD, U.K. <ppgscience@yahoo.com>

²Biodiversity and Macroecology Group, Dept of Animal and Plant Science,
Sheffield S10 2TN, U.K. <m.dallimer@sheffield.ac.uk>

Errata

Bird observations in Mali (*Malimbus* 29: 123–125).

An editorial error caused a change in meaning of the description of Greater Swamp Warbler *Acrocephalus rufescens* in this article. The description of the bird should read: “...we observed a rather dark brown, long-billed, heavy *Acrocephalus* with a long rounded tail and all-dark legs, a grey wash on the underparts and lack of a prominent supercilium, diagnostic of this species.” The description as printed stated that the bird had a prominent supercilium. Apologies to the authors of this note.

News & Letters — Nouvelles & Lettres

International Ornithological Congress 2010: call for symposium proposals

The 25th International Ornithological Congress will be held in Campos do Jordão, Brazil, 22–28 August 2010. The Scientific Program Committee (SPC) now invites proposals for symposia.

Symposia are aimed at the general ornithologist and cover current research. Each should have two co-conveners, with preference given to symposia with co-conveners from different continents, and, failing this, different countries. Each will include two keynote addresses summarizing global progress in the field over the last four years, and address future research priorities. Conveners may choose themselves as keynote speakers, but may organize only one symposium and must have a firm commitment from keynote speakers to attend before proposing them. Other speakers will be chosen by conveners, with guidance from the SPC, and will include persons who have identified the symposium they would like to join. Conveners should inform speakers that they must be willing to submit a paper on their presentation, as the conference proceedings will be published. The call for papers will come in early 2009. The IOC cannot provide financial assistance to symposium conveners or participants. Conveners must make this clear to participants.

Proposals must be received by 1 June 2008. Please provide a symposium title, names and contact details of conveners and keynote speakers, goals and objectives of the symposium (400 words maximum) and a brief outline of what each keynote speaker will cover, with preliminary titles if possible. Justify (250 words maximum) why the symposium is important to IOC participants. If you cannot find a co-convenor from another continent or country, explain why. The justification will not appear in the programme or on the web site. Send this information by email to the SPC chair, Carol M. Vleck, at <ioc2010@iastate.edu>, or post it to the address below this announcement.

Proposals will be reviewed by the SPC in August 2008 and proposers will be notified as to whether their proposal has been accepted shortly thereafter. Summaries of accepted symposia will be posted on the IOC website.

For more information, consult the IOC web site <<http://www.i-o-c.org>> or <<http://www.ib.usp.br/25ioc>> or contact the Congress Secretary General, Cristina Miyaki, at <ioc2010@ib.usp.br> or at IOC 2010, Depto de Genética e Biologia Evolutiva, Inst. de Biociências, Univ. de São Paulo, Rua do Matão 277, São Paulo, SP, 05508-090, Brazil.

Carol M. Vleck,
2010 IOC Scientific Program Committee Chair,
Dept of Ecology, Evolution & Organismal Biology,
253 Bessey Hall, Iowa State University, Ames, IA 50011, U.S.A.

Society Notices — Informations de la Société

Bob Sharland: a tribute on his 90th birthday

This issue of *Malimbus* is dedicated to R.E. (Bob) Sharland, a founder member of the Nigerian Ornithologists' Society in 1964, and a Council member of the N.O.S. and its successor the W.A.O.S. for all 43 years since. Bob has just achieved the venerable age of 90 and it gives us, his many friends in W.A.O.S., much pleasure to congratulate him, to thank him for all that he has done for the Society, and to wish him many more years of enjoyable birding.

John Elgood and Bob founded our Society half of Bob's lifetime ago, in February 1964, when ornithologists throughout West Africa were as rare as hens' teeth. Bob lived in Kano, John the length of Nigeria away in Ibadan, and our journal, then the rather primitive *Bulletin of the Nigerian Ornithologists' Society*, was produced in Zaria. From the outset Bob took an active role, furthering our interests in every way possible. He made six contributions to the four issues of the *Bulletin* in 1964, and he shared his already substantial knowledge of Nigeria's bird life by keeping an ever-open door at home and jumping at the slightest chance to take like-minded newcomers on birding trips far and wide across the north of the country.

An accountant by profession, for years with Nigerian Oil Mills, Bob was, and remains, an all-round naturalist. His main interest is birds, in particular mist-netting and ringing them for study purposes, but he has an enviable field-won knowledge also about butterflies, trees and flowers. An avid conservationist, he has given much support too to the Nigerian Field Society and the Nigerian Conservation Foundation. N.C.F. Scientific Committee Chairman Phil Hall writes: "When I first arrived in Nigeria in 1972, Bob was always available to provide support and advice as well as a comfortable bed at his house in Kano. In the first few months of my stay, we travelled together to Malamfatori on the NE shore of Lake Chad where we spent a week ringing Palaearctic migrants at the Fisheries Station and I was able to learn an immense amount from his considerable knowledge. He was a very enthusiastic bird ringer and until he departed from Nigeria, he maintained the *Nigerian Bird Ringing Report*. In 1985, he returned to Nigeria in the company of John Ash to undertake a comprehensive survey of important bird areas throughout the country on behalf of ICBP and the Nigerian Conservation Foundation. The report that they subsequently published laid the foundations for a sound conservation programme in Nigeria and many of the areas that they identified are now fully protected. On behalf of the Scientific Committee of the NCF, we would like to wish Bob a very happy 90th Birthday and would love to welcome him back to Nigeria to enable him to see at first hand everything that has been achieved as a result of his pioneering work."

When I left Nigeria in 1967, Bob took over the administration of the Society's affairs, filling the offices of Secretary and Treasurer until 1978 and remaining as Treasurer and Membership Secretary to this day. Perhaps no-one has contributed more than he has to the *Bulletin* and *Malimbus*: some 85 papers, articles, notes and reports altogether (a full list of Bob's publications in our journal may be found on the W.A.O.S. web site). The very first was his report on bird ringing, a feature that continued annually until his 28th report in 1986. The breadth of his birds-in-the-hand and ringing interests is shown by articles on netting hirundines by flicking (1965), weights of Sedge Warblers and Reed Warblers (1966), recoveries of *flava* wagtails (1967), recaptures of resident birds (1967) and ringing recoveries between Nigeria and E Europe (1997). Another regular feature over the decades has been his annual Accounts.

Bob's greatest passion has been wetland birds. As a member of the International Wildfowl Research Bureau's Duck Working Group he published a series of papers in the *Bulletin* on wildfowl censuses. Anything that keeps its toes wet caught his imagination, and the journal has seen articles of his on Finfoots (Finfeet, he calls them), Pygmy Geese, Little Bitterns, Hottentot Teal, Three-banded Plovers, Cormorants, Marbled Ducks, European Moorhens, Black-headed and Grey-headed Gulls. Another strength has been the compilation of annotated regional avifaunal checklists, on the Jos-Bauchi Plateau, Tivland, Mallam'fatori, Yankari Game Reserve (now National Park), Nindam Forest (Kagoro) and of course his own much-loved Kano State (1981, *Malimbus* 3: 7-30). In his affectionate obituary of N.O.S. co-founder John Elgood in *Malimbus* 21: 74-75 (1999), Bob recalls that when John stayed with him in 1976 John produced a report on the wetlands between Hadejia and Nguru, for Kano State Department of Agriculture, which led to the area being officially gazetted as a Wetland Reserve. You can bet that Bob undertook a large part of the fieldwork.

The Marbled Ducks and European Moorhens were new to W Africa, as was Bob's Olive-tree Warbler netted in Kano. Of land birds, cuckoos have always interested him and back in 1959 it was he who taught me, completely green to African ornithology as I was, how widespread Solitary Cuckoos are on Fernando Po island (now Bioko): they were calling on all sides, though we never did see one there. Many years later he posed for me the riddle of supposing that Black Cuckoos must be in the Zaria district even though at that time none had ever been seen or heard, nor a feather or egg found. Answer: Zaria Snowy-crowned Robin-Chat songs contain Black Cuckoo mimicry. But later we found that both species are rare spring visitors there from the south, so maybe the robin-chat learned to imitate the cuckoo far afield.

Bob has always been an early bird, a very early one. At the Pan-African Ornithological Conference in Lilongwe, Malawi, I remember getting up early to put in some pre-breakfast birding and being startled to come across the black form of Bob just discernible in rank vegetation, silhouetted against the early dawn light shining from the river surface. He was staring fixedly at something through his binoculars. For a whole minute I scanned the river bank where he was looking but could see

nothing. Approaching him, I was mischievously teased with “Look for the eye, there, in the reeds.” but still drew a blank until he pinpointed the huge eye for me and its owner gradually took shape around it: a rare White-backed Night Heron, to this day my one and only encounter.

Bob’s discovery of that eye was an admirable piece of field craft; he was and doubtless still is an observant naturalist with an excellent eye of his own (and a fine ear too). It is a tribute to his enthusiasm and determination, that in his eighties he regularly travelled with nature tours to every corner of the world in search of birds, plants and insects. May he find plenty more exciting destinations well into his nineties too.

All of this tells of Bob Sharland the ornithologist, his love of Nigerian bird life and his support for our Society and unfailing promotion of its interests over the decades; but it barely touches upon his personality: Bob Sharland the man. It is by way of his engaging character, generosity of spirit, solicitous hospitality, friendship and always being there for his colleagues, that he has made such a mark upon W.A.O.S.

Mike Dyer recalls that, arriving in Nigeria to study Red-throated Bee-eaters at Ahmadu Bello University in Zaria in the early 1970s, “Bob’s enthusiasm was immediately apparent and in no time at all he had arranged to come back the following weekend on a long detour (a daunting task in those days, travelling between Kano and Zaria) to pick me up and head off into the bush somewhere. That is absolutely characteristic of him. For the next four or five years heading off into the bush with his nets and camping gear at weekends became something of a ritual.

“It was on visits to Old Birnin Gwari, lion country well to the west of Zaria, that I have my fondest memories of him. Usually we arrived well after sunset. Bob would pull off the road straight onto an overgrown bush track and drive for miles into the middle of nowhere. Suddenly he’d stop at a derelict, half-roofed mud shack, which was to be home for the weekend. Shuffling about before dawn, clanging net-poles and tripping over things before he headed out to set his nets up was routine, and dawn had hardly broken before he would return with some exciting Grey-headed Olive-backs or some such, measure and ring his captures, take a quick breakfast, then back to the field for the day. Another time there he saw some swifts drop out of the sky at dusk and dive into an abandoned village well. Long before dawn he was up and about, draping his mosquito net over the well’s entrance, and again breakfast was heralded by Bob’s reappearance, this time with a great catch of Mottle-throated Spinetails.”

Arriving in Kano to take up a position at Bayero University in 1977, Roger Wilkinson also greatly benefited from Bob’s kindness: “He was back in Nigeria from his first retirement when my wife and I first met him. Having heard through the grapevine that a fellow bird enthusiast was coming to the university and managing to find out exactly where we were staying, he was kindness personified, inviting us to his house for good companionship, conversation and food. One particularly memorable meal was a stew of Knob-billed Goose bulking out the flesh of Nigeria’s first Marbled Teal, shot from a flock of 50 by a hunter near Nguru. On later occasions

Bob would come to our home for dinner but once he and I were very late; we had been trying to net nightjars but succeeded only in bringing home mist-nets full of bats that Bob insisted had to be dealt with before we could start the meal.

“His life has been dominated, or so it seemed to me, by his out-of-office and even out-of-town activities. A keen and experienced mist-netter and ringer, he took us many times to his ringing sites and favourite birding spots near and far from Kano. As a true naturalist he had boundless energy and enthusiasm for life and for birds, trees and flowers, preferring always to leg it through the bush rather than sit to see what might come by. It is amazing that at 90 Bob retains all of his zest. I have learned much from him, am privileged still to be able to enjoy his company, and wish him many more years of outdoors enjoyment.”

For Gérard Morel, ex-President of W.A.O.S., the relationship with Bob was a little different: “I lived for many years in Senegal, far from Nigeria, and our contact was only by letters. But on retiring back to France I soon made sure to meet Bob at the annual meetings of W.A.O.S. Council in England and on the continent, where several meetings were held between 1990 and 2000 in Normandy and the Netherlands, where Bob did not hesitate to join the other participants and demonstrate once again his passion for birds.

“But I should like to highlight his essential role in the Society, in carrying out many uninviting and often obscure administrative tasks. He continued to monitor the accounts, look for the best and cheapest printers, remind forgetful members to pay their subscriptions and manage the distribution of the journal. Little used to computers, but always with great concern for economy, he would write in the briefest letters his precise requests in a concise but perfectly clear manner. It is thanks to his management that the subscription was maintained for so long without increase, without adversely affecting the quality of the journal, in fact, quite the contrary.

“I find it hard to imagine the Society without Bob and cannot forget the warm welcome at his peaceful house, deep in the country near a waterway and, as President, I owe him a great deal and thank him for such a pleasant and efficient collaboration. May you well continue, dear Bob, *en route* to your centenary.”

It is with great pleasure that W.A.O.S. Council has offered Bob Honorary Life Membership as a small birthday present in token of our gratitude.

Hilary Fry

Bob Sharland: hommage pour son 90ème anniversaire

Ce numéro de *Malimbus* est consacré à R.E. (Bob) Sharland, un des membres fondateurs de la Nigerian Ornithologists' Society en 1964, membre du Conseil de la N.O.S. et de son prolongement, la S.O.O.A. (Société d'Ornithologie de l'Ouest Africain) pendant 43 ans. Bob vient juste d'atteindre l'âge vénérable de 90 ans et cela donne à ses amis de la S.O.O.A. le plaisir de l'en féliciter ainsi que le remercier pour

tout ce qu'il a fait pour la Société ainsi que de lui souhaiter d'observer encore les oiseaux de nombreuses années

John Elgood et Bob fondèrent notre Société en février 1964, à peu près à mi-chemin de la vie de Bob, alors que les ornithologues en Afrique de l'Ouest étaient alors aussi rares que les poules avec des dents. Bob habitait Kano, John à l'autre bout du Nigeria à Ibadan, et notre journal, le *Bulletin of the Nigerian Ornithologists' Society*, assez primitif, était produit à Zaria. Dès le départ, Bob joua un rôle actif, stimulant notre intérêt de toutes les façons. Il fit six publications dans les quatre numéros du *Bulletin* de 1964, partageant sa connaissance déjà considérable des oiseaux de Nigeria en gardant sa maison ouverte et en sautant sur la moindre occasion d'accompagner les visiteurs pour une sortie dans le nord du pays.

Comptable de profession pendant des années aux Nigerian Oil Mills, Bob était, et demeure, un naturaliste dans l'âme. Son intérêt principal est les oiseaux, en particulier la capture aux filets pour le baguage, mais il a aussi une connaissance enviable acquise sur le terrain des papillons, des arbres et des fleurs. Conservationniste convaincu, il a beaucoup aidé la Nigerian Field Society et la Nigerian Conservation Foundation. Phil Hall, Président du Comité Scientifique du N.C.F., écrit: "Quand je suis arrivé pour la première fois au Nigeria en 1972, Bob était toujours là pour fournir aide et conseil ainsi qu'un lit confortable chez lui à Kano. Au cours de mes premiers mois, nous sommes allés ensemble à Malamfatori sur la rive NE du lac Tchad où nous sommes restés une semaine à baguer des migrateurs paléarctiques à la Station Piscicole et j'y ai appris beaucoup grâce à ses connaissances considérables. C'était un bagueur enthousiaste et jusqu'à son départ du Nigeria, il anima le *Nigerian Bird Ringing Report*. En 1985, il retourna au Nigeria accompagné de John Ash et entreprit un inventaire complet des zones importantes pour les oiseaux à travers le pays pour le compte du ICBP et de la Nigerian Conservation Foundation. Le rapport, qu'ils publièrent par la suite, jeta les bases d'un solide programme de conservation pour le Nigeria et beaucoup des sites qu'ils identifièrent sont maintenant complètement protégés. Nous voudrions, de la part du Comité Scientifique de la N.C.F., souhaiter à Bob un heureux anniversaire pour ses 90 ans et aimerions l'accueillir encore au Nigeria pour lui montrer tout ce qui a été réalisé à la suite de son œuvre de pionnier."

Quand je quittai le Nigeria en 1967, Bob se chargea de l'administration de la Société, remplissant le rôle de Secrétaire et de Trésorier jusqu'en 1978 et demeura Trésorier jusqu'à ce jour ainsi que Secrétaire aux Abonnements. Peut-être personne n'a publié autant que lui dans le *Bulletin* et *Malimbus*: en tout quelque 85 articles, notes et rapports (une liste complète des publications de Bob dans notre journal se trouve sur le site web de la S.O.O.A.). Sa toute première publication était son rapport de baguage, une caractéristique qui subsista jusqu'au 28ème rapport en 1986. L'intérêt d'avoir les oiseaux en mains et de les baguer apparaît en feuilletant les articles sur le baguage d'hirondelles (1965), le poids des *Phragmites* des joncs et des *Rousserolles effarvates* (1966), les reprises des bergeronnettes *flava* (1967), les reprises d'oiseaux résidents (1967) et les reprises de bagues entre le Nigeria et l'est de

l'Europe (1997). Un autre aspect fut pendant des décades la publication d'un rapport financier annuel.

La grande passion de Bob fut les oiseaux d'eau. Comme membre du Groupe de travail sur les canards de l'International Wildfowl Research Bureau il publia une série d'articles dans le *Bulletin* sur les recensements de sauvagine. Son imagination s'enflammait pour tout ce qui se permet de se mouiller les pattes, et le bulletin a vu des articles sur les Grébifoulques (Finfoots), qu'il appelait Finfeet, les Sarcelles à oreillons, les Blongios nains, les Sarcelles hottentotes, les Pluviers à triple collier, les Cormorans, les Sarcelles marbrées, les Poules d'eau d'Europe, les Mouettes rieuses et à tête grise. Un autre exemple de son énergie fut la compilation des listes régionales d'avifaune, par exemple celle du Jos-Bauchi Plateau, Tivland, Mallam'fatori, Yankari Game Reserve (à présent Parc National), Nindam Forest (Kagoro) et bien entendu le Kano State qu'il aimait tant (1981, *Malimbus* 3: 7–30). Dans son amicale notice nécrologique pour John Elgood, co-fondateur de la N.O.S. (1999, *Malimbus* 21: 74–75), Bob rappelle que quand John était avec lui en 1976 ce dernier écrivit un rapport sur les zones humides entre Hadejia et Nguru, pour le département de l'agriculture du Kano State, avec pour résultat l'inscription de la zone comme Réserve humide. On peut parier que Bob assumait une large part du travail de terrain.

La Sarcelle marbrée et la Poule d'eau d'Europe étaient nouvelles pour l'Afrique de l'Ouest, ainsi que l'Hypolaïs des oliviers capturée par Bob à Kano. Parmi les oiseaux terrestres, les coucous l'ont toujours intéressé et en 1959 c'est lui qui m'apprit, car j'étais tout à fait novice en ornithologie africaine, combien le Coucou solitaire était répandu sur l'île de Fernando Po (à présent Bioko): il criait partout et pourtant nous n'en vîmes aucun. Bien des années après il me laissa deviner si le Coucou criard existait dans le district de Zaria: à l'époque aucun n'avait été vu ni entendu, et encore moins une plume ou un œuf trouvés. Réponse: le chant du Petit Cossyphe à tête blanche contient des imitations du Coucou criard. Mais plus tard on découvrit que les deux espèces sont de rares visiteurs de printemps venant du sud, si bien que peut-être le cossyphe aurait appris ailleurs à imiter le coucou.

Bob a toujours été un lève-tôt, même une lève-très-tôt. Au Congrès Ornithologique Panafricain de Lilongwe, Malawi, je me rappelle m'être levé tôt pour faire quelques observations sur les oiseaux avant le petit déjeuner et d'avoir eu la surprise d'apercevoir la silhouette sombre de Bob, à peine visible dans les hautes herbes, et se détachant sur le fond de la rivière. Il fixait quelque chose à travers ses jumelles. Pendant plusieurs minutes je fouillai la rive mais ne vis rien. Comme j'approchai, il me taquina et me dit "Regardez l'œil, là, dans les roseaux" mais je ne voyais toujours rien du tout jusqu'à ce qu'il m'indiqua un œil énorme et que son propriétaire prit lentement forme: c'était le rare Bihoreau à dos blanc, jusqu'à ce jour ma seule et unique observation.

La découverte de cet œil était un admirable exemple de sa virtuosité sur le terrain; il était et demeure sûrement un observateur de la nature avec un excellent coup d'œil et une oreille fine. C'est un témoignage de son enthousiasme et de sa volonté, que

passé 80 ans il parcourt, grâce aux excursions, tous les coins du monde en quête d'oiseaux, de plantes et d'insectes. Puisse-t-il trouver après 90 ans encore beaucoup d'autres destinations de voyage.

Tout cela parle du Bob Sharland ornithologue, de sa passion pour les oiseaux de Nigeria, de son soutien à notre Société et de la défense sans faille de ses intérêts, mais touche à peine à sa personnalité: Bob Sharland lui-même. C'est grâce à son caractère séduisant, à son esprit généreux, à son hospitalité attentionnée, à son amitié et au fait d'être toujours là pour ses collègues, qu'il laissa une telle empreinte sur S.O.O.A.

Mike Dyer se rappelle que, arrivant au Nigeria pour étudier les Guépriers à gorge rouge à l'université Ahmadu Bello à Zaria début 1970, "l'enthousiasme de Bob était immédiatement apparent; en un rien de temps il s'était arrangé pour revenir le week-end suivant malgré un long détour (ce n'était pas rien de voyager de Kano à Zaria à cette époque), me prendre au passage et repartir quelque part dans la brousse. Cela était absolument typique de lui. Pendant les quatre ou cinq années à venir, partir en brousse avec ses filets et son matériel de camp pour le week-end appartenait en quelque sorte à un rituel.

"C'est de ces expéditions à Old Birnin Gwari, une région avec des lions bien à l'ouest de Zaria, que je garde mes meilleurs souvenirs de lui. Habituellement, nous arrivions bien avant le coucher du soleil. Bob prenait alors soudain un sentier embroussaillé et conduisait pendant plusieurs kilomètres dans l'inconnu. Tout à coup, il s'arrêtait près d'une hutte de pisé abandonnée, avec la moitié d'un toit, qui serait notre base pour la fin de la semaine. S'agitant avant l'aube et rassemblant avec bruit les perches, trébuchant au milieu de notre fourbi avant de sortir pour poser ses filets était une routine; l'aube s'était à peine levée qu'il rentrait avec quelque Sénégal vert à joues blanches ou autre espèce; il mesurait et baguait sa capture puis après un rapide petit déjeuner retournait en brousse pour la journée. Une autre fois il vit quelques martinets tomber du ciel au crépuscule et plonger dans un puits de village abandonné. Bien avant l'aube il était debout, avait recouvert l'entrée du puits avec sa moustiquaire et encore une fois le petit déjeuner fut marqué par la réapparition de Bob, cette fois avec une bonne capture de Martinets d'Ussher."

Arrivé à Kano pour prendre son poste à Bayero University in 1977, Roger Wilkinson profita beaucoup de la gentillesse de Bob: "Il était de retour au Nigeria après son premier départ en retraite quand nous l'avons rencontré ma femme et moi pour la première fois. Ayant appris par la rumeur publique qu'un autre mordue des oiseaux arrivait à l'université, il s'arrangea pour savoir où nous étions; il était la gentillesse en personne, nous invita chez lui où on trouvait compagnie, conversation et repas. Un plat particulièrement mémorable fut un ragoût de Canard à bosse où dominait la chair de la première Sarcelle marbrée de Nigeria, tirée parmi un vol d'une cinquantaine par un chasseur près de Nguru. Plus tard Bob venait à la maison pour dîner mais une fois nous eûmes beaucoup de retard. Nous avions essayé de capturer des engoulevents mais n'avions réussi qu'à revenir avec des filets pleins de chauves-souris que Bob insista pour sortir des filets, avant de commencer le repas.

“Sa vie semble avoir été dominée, du moins me semble-t-il, par ses activités hors bureau et même loin de la ville. Preneur d’oiseaux au filet passionné et plein d’expérience, il nous emmena souvent sur ses sites préférés parfois près mais aussi loin de Kano. Naturaliste authentique, il avait une énergie et un enthousiasme inépuisables pour la vie et les oiseaux; plutôt que d’attendre et de voir ce qui allait arriver, il préférait marcher à travers la brousse. Ce qui est surprenant c’est que Bob ait gardé toute sa joie de vivre jusqu’à 90 ans. J’ai beaucoup appris de lui et je m’estime heureux d’être encore capable de profiter de sa compagnie; je lui souhaite d’être encore capable longtemps de profiter de la nature.”

Pour Gérard Morel, ex-Président de S.O.O.A., les relations avec Bob ont eu un caractère un peu différent: “J’ai en effet longtemps résidé au Sénégal, donc loin du Nigéria et nous n’avions que des contacts épistolaires. Mais, de retour en France, à ma retraite, je n’ai pas tardé à rencontrer Bob en Angleterre pour les réunions annuelles du Conseil de la S.O.O.A. et aussi sur le continent car, entre 1990 et 2000, plusieurs réunions eurent lieu en Normandie et aux Pays-Bas et selon son habitude il n’hésita pas à se joindre aux autres participants et nous montrait une fois encore sa passion des oiseaux.

“Mais je voudrais insister sur son rôle essentiel dans la Société pour des tâches administratives rébarbatives et souvent obscures. Il continuait à assurer le suivi de la comptabilité, recherchait le meilleur et le moins cher des imprimeurs, rappelait aux membres négligents le paiement de leur cotisation et assurait l’expédition des bulletins. Peu habitué à l’ordinateur et toujours dans un grand souci d’économie, il m’écrivait sur de minuscules lettres l’objet de sa requête qui était présenté dans un style concis mais parfaitement clair. C’est grâce à une telle gestion que le montant de la cotisation fut maintenu si longtemps sans que cela nuise à la qualité du bulletin, bien au contraire.

“J’imagine mal la Société sans Bob et ne puis oublier son accueil chaleureux dans sa maison tranquille, perdue dans la campagne à proximité d’un cours d’eau et, en tant que Président, je tiens à le remercier d’une collaboration aussi agréable qu’efficace. Bonne continuation, cher Bob, et en route pour votre centenaire, n’est-ce pas.”

C’est avec grand plaisir que le Conseil de S.O.O.A. a offert à Bob une Adhésion Honoraire à Vie, faible témoignage de notre gratitude.

***Bulletin of the Nigerian Ornithologists' Society* now on W.A.O.S. web site**

The full text of Volumes 11–14 (1975–8) of the *Bulletin of the Nigerian Ornithologists' Society* has been placed on the W.A.O.S. web site <<http://malimbus.free.fr>>. Mary Gartshore kindly loaned the issues from which the pages were scanned.

With the 26 volumes of *Malimbus* already on the web site, there are now 30 volumes of full text available. The latest addition brings pdfs of 424 extra pages, 52 papers and eight issues. A species index of all volumes of the *Bulletin* is already on the web site.

Bull. Niger. Orn. Soc. was transformed into *Malimbus* in 1979. Though most of their material is from Nigeria and Ghana, these volumes of the *Bulletin* contain records from eight West African countries. There are also accounts of the process whereby the Nigerian Ornithologists' Society was “west-africanised” (*Bull. Niger. Orn. Soc.* 13: 85) and the *Bulletin* converted into *Malimbus* (*Bull. Niger. Orn. Soc.* 14: 1–3).

It is the intention of Council to add the full text of the remaining ten volumes of the *Bulletin* to the web site in due course.

P.W.P. Browne

Le *Bulletin of the Nigerian Ornithologists' Society* est maintenant sur le site Internet de la S.O.O.A.

Le texte complet des Volumes 11–14 (1975–8) du *Bulletin of the Nigerian Ornithologists' Society* a été placé sur le site Internet de la S.O.O.A. <<http://malimbus.free.fr>>. Mary Gartshore a aimablement prêté les numéros dont les pages ont été scannées.

Avec les 26 volumes de *Malimbus* déjà sur le site Internet, le texte complet de 30 volumes est désormais accessible. Le dernier ajout porte sur 424 pages pdf, 52 articles et 8 numéros. Un index des espèces pour tous les volumes du *Bulletin* est déjà sur le site Internet.

Le *Bull. Niger. Orn. Soc.* a été transformé en *Malimbus* en 1979. Bien que la majeure partie de son contenu ait été relative au Nigeria et au Ghana, ces volumes du *Bulletin* contiennent des notes sur huit pays d'Afrique de l'Ouest. On y trouve aussi des compte-rendus sur le processus selon lequel la Nigerian Ornithologists' Society a été “ouestafricanisée” (*Bull. Niger. Orn. Soc.* 13: 85) et le *Bulletin* transformé en *Malimbus* (*Bull. Niger. Orn. Soc.* 14: 1–3).

Le Conseil a l'intention d'ajouter le texte complet des dix derniers volumes du *Bulletin* sur le site Internet.

P.W.P. Browne

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 Plateau State, **Nigeria**

LAFFARGUE, C., La Tuilerie, F-47200 Forques, **France**

PHALAN, B., Zoology Dept, Downing St, Cambridge CB2 3GJ, **U.K.**

SIACA, A., Conservation Soc. of Sierra Leone, POB 1292 Freetown, **Sierra Leone**

SKEEN, R.Q., Gt Bustards, Docking, Kings Lynn PE31 8NG, **U.K.**

SMITH, Rev. R., 230 Stevenson Rd, Derby DE2 3BL, **U.K.**

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BARKER, J.C., Avondale, Westbourne Rd, Westbourne, Sussex PO10 8UL, **U.K.**

ELLIOT, Sir C.C.H., Bt, Ph.D., 172 Woodstock Rd, Oxford, **U.K.**

HANDKE, C., Stendahlerstr. 13, D-39326 Loitsche, **Germany**

KING, T., Rue de Piroy 107, B-5020 Malone, **Belgium**

MANIRE, K., Peace Corps, BP 3194, Lome, **Togo**

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SKINNER, Dr N.J., 48 Everitt Court, Swonells Walk, Oulton Broad, Lowestoft NR32
 3PL, **U.K.**

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Malimbus publishes research articles, reviews and news about West African ornithology.

Papers and **Short Notes** must be original contributions; material published elsewhere, in whole or in part, will not normally be accepted. Short Notes are articles not exceeding 1500 words (including references) or four printed pages in length. Wherever possible, manuscripts should first have been critically scrutinised by at least one other ornithologist or biologist before submission. Manuscripts will be sent for critical review to at least one relevant authority.

Items for **News & Letters** should not exceed 1000 words.

Contributions are accepted in English or French; editorial assistance will be made available to authors whose first language is not one of these. Submission by email (attached file) is preferred. Consult the editor for further details, e.g. acceptable software. For submissions on paper, two copies are required, typed on one side of the paper, with double spacing and wide margins.

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Format of tabular material, numbers, metric units, references, etc. should match recent issues. Note particularly: dates are written 2 Feb 1990 but months standing alone may be written in full; times of day are written 6h45, 17h32 and coordinates in the form 7°46'N, 16°4'E (no leading zeros); numbers up to ten are written in full, except when followed by abbreviated units (e.g. 6 m), numbers from 11 upwards are written in figures except at the beginning of a sentence. All references mentioned in the article, and only such, must be listed in the bibliography.

Avifaunal articles must contain a map or gazetteer, including all localities mentioned. They should include brief notes on climate, topography, vegetation, and conditions or unusual events prior to or during the study (e.g. late rains etc.). **Species lists** should include only significant information; full lists are justified only for areas previously unstudied or unvisited for many years. Otherwise, include only species for which the study provides new information on range, period of residence, breeding etc. For each species, indicate range extensions, an assessment of abundance (*Malimbus* 17: 36) and dated breeding records; indicate migratory status and period of residence only as shown by the study. Where appropriate, set data in context by brief comparison with an authoritative regional checklist. Lengthy species lists may be in tabular form (e.g. *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) or in the textual format of recent issues. **Taxonomic sequence** and **scientific names** (and preferably also **vernacular names**) should follow Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), or Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) or *The Birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), unless reasons for departure from these authorities are stated. A **more complete guide for authors** of avifaunal papers, including the preferred abundance scale, appeared in *Malimbus* 17: 35–39 and an augmented and updated version of this may be found on the web site (<http://malimbus.free.fr/instmale.htm>); a copy may be obtained from the Editor, who will be happy to advise on the presentation of specific studies.

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A pdf file of Papers and Short Notes, and one copy of the issue in which they appear, will be sent to single or senior authors, *gratis*.

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MALIMBUS

Journal of West African Ornithology
Revue d'Ornithologie de l'Ouest Africain



VOLUME 30 Number 2
ISSN 0331-3689

September 2008

published by:
publiée par:

West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain

West African Ornithological Society

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La Société tire son origine de la "Nigerian Ornithologists' Society", fondée en 1964. Son but est de promouvoir l'ornithologie ouest-africaine, principalement au moyen de sa revue *Malimbus* (anciennement *Bulletin of the Nigerian Ornithologists' Society*).

Les demandes d'adhésion sont les bienvenues. Les cotisations annuelles sont de £15 (€22) pour les Membres Ordinaires et de £30 (€44) pour les Sociétés (les cotisations peuvent être payées en £ sterling au Trésorier ou en Euro au Président). Les Membres Ordinaires reçoivent *Malimbus* par courrier ordinaire et les Sociétés par courrier aérien, gratuitement. Un supplément est exigé des Membres Ordinaires pour le courrier aérien (demander au Trésorier le tarif).

Anciens Numéros: Les Volumes 11–14 (1975–78) du *Bulletin of the Nigerian Ornithologists' Society* (du même format que *Malimbus*) sont disponibles à £2/€3.50 par numéro (£4/€7 par volume) ou £15/€25 l'ensemble. Les Volumes 1–9 de *Malimbus* sont disponibles à £3/€5 par numéro (£6/€10 par volume) et les Vols 10–30, à £5/€8.50 par numéro (£10/€17 par volume). Une série complète de *Malimbus* (du Volume 1 jusqu'au plus récent) peut être acquise avec un rabais de 20% sur le prix total. Frais de port et emballage sont gratuits. Veuillez joindre le paiement à votre commande et l'adresser au Trésorier.

Bourses de Recherches de la S.O.O.A.: Les conditions à remplir pour les candidatures se trouvent dans *Malimbus* 25: 72–75 et sur le site web, ou peuvent être obtenues auprès du Secrétaire du Conseil (adresse ci-dessus).



The avifauna of Mole National Park, Ghana

by Françoise Dowsett-Lemaire & Robert J. Dowsett

Le Pouget, 30440 Sumène, France. <dowsett@aol.com>

Received 3 August 2007; revised 8 May 2008.

Summary

Mole National Park (4840 km²) is situated entirely in the Sudanian zone. Habitats include different types of Sudanian woodland, riparian forest on (mainly) seasonal rivers, a few laterite pans (bovals) and small seasonal floodplains, and the rocky escarpment of Konkori. We recorded 270 species on two visits in August–September 2004 (at the peak of the rains) and March 2005 (near the end of the dry season). Taking into account all existing references and unpublished reports, at least 350 species have been recorded (excluding some doubtful identifications). At least 36 of 37 Sudanian biome-restricted species known from Ghana are present. Over the past 30 years, the avifauna has undergone few changes: some species of wet grassland have disappeared (due probably to over-grazing by large mammals), but overall the area has not become any drier, as shown by recent records of cuckoos and other species with northward extensions of known range. The “Data Deficient” Dorst’s *Cisticola* *Cisticola guinea* is locally common. Speckled Mousebird *Colius striatus*, which may have appeared in Mole in the 1970s, is no longer to be found.

Résumé

Le Parc National de Mole (4840 km²) est situé entièrement dans la Région soudanienne. Les milieux comprennent différents types de forêt claire soudanienne, des forêts semi-sempervirentes longeant des rivières (surtout) temporaires, quelques cuirasses latéritiques herbeuses et plaines inondées saisonnièrement, et l’escarpement rocheux de Konkori. Nous avons observé 270 espèces au cours de deux visites: août–septembre 2004 (au milieu des pluies) et mars 2005 (fin de la saison sèche). Après examen de toutes les références et rapports non publiés, l’avifaune de Mole comprend au moins 350 espèces (après exclusion d’identifications douteuses). Au moins 36 des 37 espèces restraints au biome soudanien connues du Ghana sont présentes. Après 30 ans, l’avifaune n’a que peu changé: quelques espèces de prairies inondées ont disparu (sans doute à cause du surpâturage local par la grande faune), mais dans l’ensemble le climat ne s’est pas asséché, comme en témoigne la présence de plusieurs coucous et autres espèces s’étendant

apparemment vers le nord. La Cisticole de Dorst *Cisticola guinea* ("données insuffisantes") est localement commune. Le Coliou strié *Colius striatus*, peut-être apparu dans les années 1970, a disparu.

Introduction

Mole National Park, covering some 4840 km², is the largest wildlife reserve in Ghana, protecting a large area of Sudanian woodland in the north of the country. The elevation ranges from 120 to 490 m a.s.l. (Schmitt & Adu-Nsiah 1993); the topography is mostly flat, with a narrow scarp running north–south. Most of the watercourses (which drain into the White Volta) are seasonal. The National Park (a Game Reserve since 1958) was gazetted in 1971.

With the creation of an important system of roads in the late 1960s, and the challenge presented by the conservation of (initially) important populations of large mammals, the park has attracted some scientific activity in past decades, including a few bird surveys. The latter were conducted mainly by students from overseas in the summer rains of 1968 (Harvey & Harrison 1970), and in July–August 1974 and 1975, and from 28 October to 3 December 1975 by Greig-Smith (1976), who drew up a first checklist of birds in tabulated form, taking into account earlier records, published or unpublished. Other (brief) accounts from that period include Genelly (1969, who identified some 90 species, July–October 1966), Maze (1971, 101 species in January, April and August 1967 and 1968), Sutton (1965, 1970, who visited in late March 1964 and December–January 1968–9), Taylor & Macdonald (1978, a brief April 1976 visit), Wink (1976) and Macdonald (1978a, b) who added a few records of migrants. Payne (1985, 2004) studied firefinches and indigobirds in October 1975, and his other records are included in Greig-Smith (1976, 1977a). Of all the above, Greig-Smith's own work was the most thorough: he recorded some 250 species himself and his tabulated list includes just over 300. However, the identity of some may be queried, he missed some records (by Sutton 1970), misplaced a few others (originating from other localities), and gave no localities for even the rarer species. The status of most species was incompletely documented: in a later publication, Greig-Smith (1977a) mentioned partial periods of passage for a number of Palaearctic migrants, but his list of intra-African migrants does not include dates, with a few exceptions discussed in the text. Apart from Sutton (1970) who stopped briefly at Konkori, other observers concentrated their activities in the south-east, around the park headquarters (Samole) and Lovi camp.

Dutson & Branscombe (1990) spent 6–9 August 1988 in Mole and briefly listed their observations. Otherwise Mole was not much visited again until January–March 1993, when Wilson (1993) studied its mammals. His account of birds is useful for the larger species but identifications of small species (with many omissions and some errors) have to be treated with caution.

We spent just over six weeks in the park, from 6 August to 9 September 2004 and 5–15 March 2005. Most rain falls from May–September, with the first scattered storms in March–April. By the 2000s the road system in the park had collapsed, and in the wet season of 2004 we worked from several bush camps on the boundary (Ducie, Jang, Kananto, Degbere, Mognori), around the Samole headquarters, and walked to Brugbani and a little beyond (Fig. 1). In March 2005 it was possible to drive through and we camped near Old Ducie, at Konkori, Nyanga, Lovi and on the Mole river near Asibey's pools. We revisited Samole and Mognori. A small amount of mist-netting was carried out on two days in August, mainly to check breeding condition. In all we recorded 270 species.

Mole NP offers tourist accommodation in the form of a motel ideally situated on a small plateau overlooking the Samole floodplain (called "Mole marsh" in various publications). Eco-tourists have shown renewed interest in Mole since 2002, and several birdwatchers who have visited (mostly in the dry season) have kindly made their records available. We have also examined two unpublished reports on dry-season visits of 1–2 days (Baha el Din & Baha el Din 1996, Plat 1997). Some of the wildlife guards working in Mole have a good knowledge of birds, especially Zachariah Wareh: we worked with all of them in the field and found their testimony useful in several respects. J.F. Walsh (*in litt.*) paid several short visits to Mole from 1971–9 and carried out aerial surveys in later years, from which he sent some unpublished records.

The updated annotated list below includes 350 species. Reasons for rejecting some doubtful records are given. The possibility that the region has undergone some environmental changes in the last 30 years is discussed in the light of small modifications in the composition of the avifauna. Nomenclature follows Dowsett & Forbes-Watson (1993) with few exceptions (cf. Dowsett-Lemaire & Dowsett 2007); we now recognize *Circaetus beaudouini* as a species distinct from *C. gallicus* (following Clark 1999). The suffixes of some species names have changed following David & Gosselin (2002a, b).

Habitats

The whole of Mole NP falls within the Sudanian vegetation zone (White 1983, syn. "Sudan-Guinea Savanna" in Fishpool & Evans 2001), and Sudanian woodland is the most extensive vegetation type. The park is traversed by several streams and rivers. Most of the smaller streams dry up in the dry season, although some on the Konkori escarpment are permanent; the larger Mole and Lovi rivers retain some pools in all months. The vegetation map in Schmitt & Adu-Nsiah (1993) shows an extensive floodplain in the basin of the Mole river in the south-east, and many small patches of woodland elsewhere get waterlogged in the rainy season. Rocky outcrops are concentrated along the Konkori escarpment in the centre of the park (Fig. 1). A few

buildings are to be found in the southeast (at Samole), including the park headquarters, staff accommodation, a museum and the Mole motel.

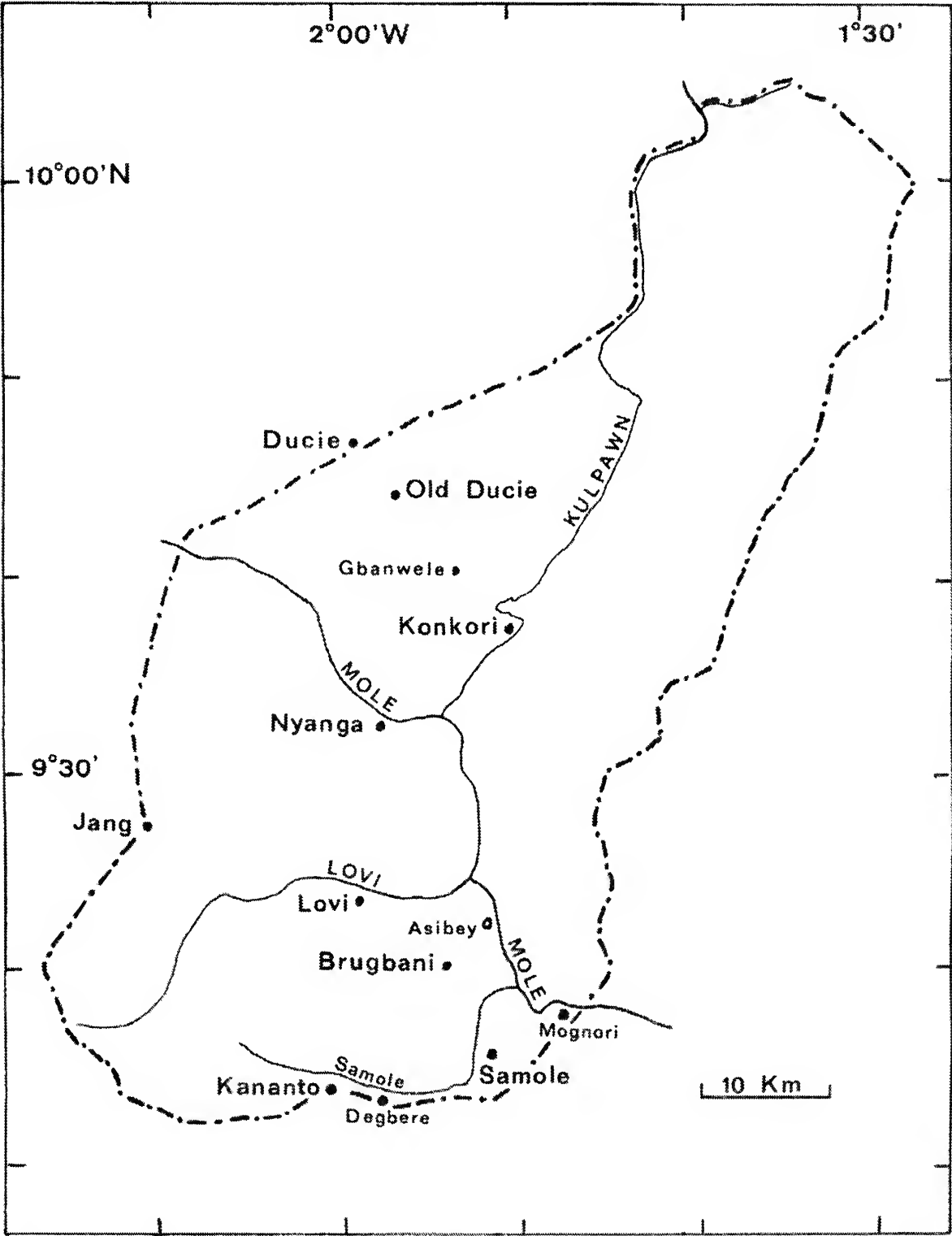


Figure 1. Mole National Park, showing rivers, streams and sites visited. The Haraba-Haraba pool is half way between “Asibey” (= Asibey’s pools) and Brugbani.

The following broad vegetation types can be recognized (following White 1983):

Fresh-water swamps. The Samole stream was dammed in the 1960s below the motel, thus creating two permanent pools, "Dam 1" and "Dam 2": these have no floating vegetation but are bordered by trees on one side and seasonally flooded grassland on the other. Seasonally flooded grassland and seasonal pools are frequent in the Mole river basin (e.g. Asibey's pools); sedges occur in the wetter sections, but there are no reed beds (*Typha*, *Phragmites*) as such. The flooded grassland below the motel is no longer as tall and dense as in the 1970s and 1980s, following intensive grazing by Elephants and other mammals fleeing poachers in the centre of the park (J. Jimah pers. comm.). Some 25 years ago the grass cover was over 2 m tall, more than twice as high as today. The large Sabory pool near Mognori, ringed by sedges and grass and covered by *Nymphaea*, never dries up. Maximum flooding in the Mole marsh (below the motel) is attained in late July or in August.

Bovals. These are a special kind of dry edaphic grassland characteristic of the Sudanian region (spelled "bowal" by White 1983). The soil, on laterite pans, is too shallow for trees to grow, and is covered in the rains by thin grassland, rarely more than 40 cm tall. A few small pools may form in rocky depressions. Bovals are especially conspicuous in the vicinity of Brugbani camp: the three largest are at least 1 km² each.

Wooded grassland and woodland. Woodland in Mole is often rather open, with the distinction between woodland and wooded grassland (the latter with less than 40% tree cover) not clearcut. Wooded grassland often replaces woodland in slightly waterlogged sections of the plateau. *Mitragyna inermis* wooded grassland is associated with floodplains; *Ziziphus mauritiana* is common on the edge of some pools. Dry woodland and wooded grassland away from floodplains include many of the tree species characteristic of Sudanian woodland: *Azelia africana*, *Combretum fragrans*, *Daniellia oliveri*, *Detarium microcarpum*, *Erythrophleum africanum*, *Isobertia doka*, *Lophira lanceolata*, *Parkia biglobosa*, *Piliostigma thonningii*, *Pterocarpus erinaceus*, *Terminalia avicennioides*, *Vitellaria paradoxa*. *Detarium* is dominant on shallow soils locally (as near Brugbani), sometimes in mono-specific stands (8–10 m high). Much of the woodland or wooded grassland elsewhere is 12–15 m tall; along the southern boundary, woodland on deeper soil is more luxuriant and reaches a height of c. 20 m (with *Azelia*, *Daniellia*, *Isobertia*, *Parkia*, *Vitellaria* among the larger trees). Only near Jang did we see a significant presence of *Acacia* spp. (mixed with broad-leaved trees such as *Vitellaria* and *Pterocarpus erinaceus*, which are both very common): *A. gourmaensis*, medium-sized *A. dudgeoni* and large (12–15 m) *A. sieberiana* all occur in dry woodland, with *A. polyacantha* (16–18 m) near small streams. Baobabs *Adansonia digitata* are very uncommon in Mole (e.g. Jang camp).

Semi-evergreen forest. Essentially riparian and found on most of the streams or rivers in the park; the width varies from a single line of trees to > 100 m on one or both sides of the river. On the Samole below the motel, the riparian vegetation is not wide, but consists of a dense low thicket of *Cola laurifolia*, *Morelia senegalensis*, *Nauclea latifolia*, the creeper *Uvaria chamae*, with the occasional tall tree (*Diospyros*

mespiliformis, *Manilkara multinervis*, *Syzygium guineense*, *Vitex doniana*) and especially *Khaya senegalensis* which can reach over 30 m. A good example of dense riparian forest is at Mognori on the Mole river, where the forest is up to 25 m tall and at least 50 m wide, with an abundance of liane tangles: *Celtis integrifolia*, *Cola laurifolia*, *Diospyros mespiliformis*, *Pterocarpus santalinoides* are all important large trees, *Parinari congensis* occurs in the flooded section and *Lonchocarpus cyanescens* is the largest woody liane. Further upstream and south of the Lovi confluence the forest is almost continuous and very dense, being 20–25 m tall: *Ceiba pentandra* and *Khaya senegalensis* are occasional emergents (over 30 m). At Kananto on the southern boundary the forest reaches at least 100 m wide and is equally tall. At the level of Nyanga camp the Mole is much wider and sandier; dense thickets on permanent pools are dominated by *Quisqualis indica* and low bushes of *Mimosa pigra*. Along the Lovi river riparian vegetation is not as continuous and is somewhat more deciduous, with clumps of thicket and scattered tall trees. Finally, the Konkori escarpment is lined with numerous strips of riparian forest: *Raphia sudanica* is conspicuous in that area, other common trees being *Azelia africana*, *Berlinia grandiflora*, *Khaya senegalensis*, *Manilkara multinervis*, *Syzygium guineense*, *Uapaca togoensis*. In a small patch of forest on the edge of Haraba-Haraba pool several *Nauclea pobeguinii* stand in the water, reaching a height of 15–18 m: this tree is typical of swamp forest in the Guineo-Congolian region and was not reported from Mole by Schmitt & Adu-Nsiah (1993).

Anogeissus groves. Away from streams, patches of tall (20–25 m) dry forest dominated by *Anogeissus leiocarpus* occur locally, as near the entrance road. This is apparently on an old village site but *Anogeissus* can only grow where the water table is high. Some groves of *Anogeissus* can also be found on the edge of floodplain, often mixed with *Ceiba pentandra* (e.g. near Degbere camp). Dry thickets or forest may form also on the edge of bovals (e.g. near Brugbani) with deciduous tree species such as *Pterocarpus lucens*.

The avifauna

The status of migrants is given after the species name: AM = intra-African migrant; PM = Palearctic migrant. Greig-Smith (1976) is mentioned as GS. Names of observers who provided unpublished records are abbreviated as follows: RC (R. Cruse), RD (R. Demey), AH (A. Hester), DH (D. Hoddinott), JJ (J. Jimah), RBP (R.B. Payne), ASR (A.S. Riley), DS (D. Shackleford), TTE (T. Traub-Evans), KV (K. Valentine), JFW (J.F. Walsh), ZW (Z. Wareh). Species observed by us are marked *.

Phalacrocoracidae

**Phalacrocorax africanus* Long-tailed Cormorant. Uncommon visitor, as in GS. Singles on two dates, Aug 2004.

Ardeidae

Botaurus stellaris Great Bittern. PM. A specimen collected Oct–Nov 1971 (Grimes 1987), and the only certain Ghanaian record, is no longer in the museum at Samole.

Ixobrychus minutus Little Bittern. Considered resident by GS, with records in the rains (Harvey & Harrison 1970) and dry season (Wink 1976, Wilson 1993). No recent records, and its status has probably changed, as the Mole marsh now appears unsuitable, especially in the dry season.

I. sturmii Dwarf Bittern. AM. The only dated records are: one Jul–Oct (Genelly 1969), three records Jul–Sep (Harvey & Harrison 1970), one 9 Sep 2004 (pers. obs.) just outside the park. Unlikely to be resident (as in GS), but an uncommon rains visitor.

**Nycticorax nycticorax* Black-crowned Night Heron. On several rivers and streams, and Mole marsh. Most records Aug–Mar, extreme dates late Jul (Harvey & Harrison 1970) and late Mar (Sutton 1965). Treated as AM by GS, but could also be PM.

Gorsachius leuconotus White-backed Night Heron. Rare in riparian thickets on the Samole stream below the motel, judging by convincing descriptions by ZW (early 2000s). Probably moves out in the dry season, but there is permanent suitable habitat on the Mole river.

**Ardeola raloides* Squacco Heron. Regular in Mole marsh. Treated as both AM and PM by GS, but all dated records fall between 12 Oct (Genelly 1969) and Apr (Maze 1971), suggestive of Palaearctic origin.

**Bubulcus ibis* Cattle Egret. AM. Common visitor to marsh or grassland, with extreme dates 16 Oct (2004, RD) and 20 Apr (ASR & DH).

**Butorides striata* Green-backed Heron. Widespread in riparian vegetation on the edge of water and common in Mole marsh; occupied nest in a *Mitragyna* by Dam 1 (Sep).

**Egretta garzetta* Little Egret. PM? One or two by Dam 1 on 8–14 Mar 2005. Recorded from 10 Feb (RC) to late Mar (Wink 1976).

**E. intermedia* Intermediate Egret. Uncommon visitor at pools (one record Aug 2004, one in early Mar 2005), as in GS.

**E. alba* Great White Egret. PM/AM? Uncommon. All dated records fall between 20 Aug (Harvey & Harrison 1970) and 20 Apr (ASR & DH). Treated as AM by GS.

**Ardea purpurea* Purple Heron. Treated as both PM and AM by GS, and dated records (several observers) are all from 22 Aug to 20 Apr, when frequent, with one exception on 16 Jun 1976 (JFW). This suggests most are Palaearctic, and there are recoveries in Ghana of birds ringed in Europe for this and the next species (Grimes 1987).

**A. cinerea* Grey Heron. Treated as both PM and AM by GS; frequent between extreme dates of 6 Aug (Genelly 1969) and 20 Apr (ASR), suggesting Palaearctic origin.

**A. melanocephala* Black-headed Heron. Uncommon visitor at least Aug–Apr (several observers).

A. goliath Goliath Heron. Vagrant: singles recorded Aug 1968 (Harvey & Harrison 1970), sometime Jan–Mar 1993 (Wilson 1993) and Mar (Grimes 1987).

Scopidae

**Scopus umbretta* Hamerkop. Common at pools and rivers.

Ciconiidae

Mycteria ibis Yellow-billed Stork. The only reports are by Maze (1971) for Jan, Apr and Aug 1967 and/or 1968. No nesting record in Mole. A colony reported by a ranger in a village east of the park (Harvey & Harrison 1970), was probably of Marabou Stork (Grimes 1987). None of the nesting colonies elsewhere in N Ghana is known to have been occupied after 1949 (Grimes 1987): colonies at Daboya and Gambaga on the White Volta were abandoned before 1971 (JFW).

Anastomus lamelligerus Openbill Stork. AM. The only dated records are late Jan (Wilson 1993) and one below the motel Jan 2005 (JJ).

Ciconia abdimii Abdim's Stork. AM. One 27 Feb 2003 (ASR) and one 26–27 Mar 2005 (AH). Probably on passage between its winter quarters in southern Africa and breeding range in the Sahel. Also known from nearby Damongo, 2 Apr (Macdonald 1979). Two other records from Mole sometime between Jan and Mar (Maze 1971, Wilson 1993) lack details sufficient to separate them from Black Stork.

C. nigra Black Stork. PM. Three, 10 Jan 1990 (Walsh 1991); one from at least 13–26 Feb 2002 (Cruse 2002); one, 27 Feb 2003 (Riley 2004).

**C. episcopus* Woolly-necked Stork. Listed as AM by GS, but probably largely resident, with local movements. One pair resident in Mole marsh in the rains, and a few on the Lovi-Mole rivers and smaller streams at both seasons, at least Aug–Apr (pers. obs., ASR, DH). Occupied nests (one with two young, 21 Jan 1988; one with three and two with two young, 19 Jan 1999) in large *Ceiba* trees near the Mole-Lovi confluence (JFW).

C. ciconia White Stork. PM. One collected in Mole (GS, Grimes 1987: 240), but the specimen, date and other details have been lost.

**Ephippiorhynchus senegalensis* Saddle-bill Stork. Apparently resident (not AM as in GS). One pair bred several times in Mole marsh: a nest in a *Khaya* contained two young 4–6 weeks old, early Jan 2002 (Portier 2002); two juveniles with an adult, 27 Feb 2003 (Riley 2004); a pair nest-building on top of an old Hamerkop nest in a *Vitex doniana* c. 22 m tall, early Sep 2004 (pers. obs.), one bird still nest-building on 17 Oct (RD) and two young fledged about Feb (wildlife guards). Also present in the Mole floodplain further north (to Asibey's pools and Lovi). Two pairs resident in the Mole/Lovi valley 1983–90, including one with a nest containing three eggs, 29 Oct 1986, one pair at a nest with one egg and two young, 17–19 Nov 1987, and the latter nest containing four eggs, 26 Oct 1988 (JFW).

**Leptoptilos crumeniferus* Marabou Stork. One nest about half way up a big *Ceiba* tree, on the edge of the Lovi river 1 km west of Lovi camp, contained two big young, 11 Mar 2005. This is a traditional nesting site, in the past occupied by more than one pair (five nests with eggs, 22 Oct 1986, JFW in Grimes 1987; 11 nests with eggs or young, 17 Nov 1987; three trees with 16 nests containing eggs or young, 11 Jan 1990, all reported by JFW). Nests also occupied Mar 1969 (Greig-Smith 1977b). Also seen frequently Mar 1964 (Sutton 1965).

Threskiornithidae

Threskiornis aethiopicus Sacred Ibis. AM. The only record appears to be Mar 1993 (Asibey's pools, Wilson 1993). Listed by GS on the basis of a nesting colony north of the Lovi attributed tentatively to this species, based on a ranger's report (Harvey & Harrison 1970), but probably in error for Marabou Stork.

**Bostrychia hagedash* Hadada. Common (up to 20 in Mole marsh) in flooded grassland, pools and rivers throughout.

Anatidae

**Dendrocygna viduata* White-faced Whistling Duck. Greig-Smith (1977a) considered it present only in the wet season, but there are a number of records from Jan–Apr, although in 2005 they had left by Feb (wildlife guards). Up to 50 in Mole marsh Aug–Sep (pers. obs.), and 250 mid-Oct 2004 (RD).

**Plectropterus gambensis* Spur-winged Goose. Treated as resident by GS, but perhaps mainly a rainy season visitor (Taylor & Macdonald 1978), when common. Present at least Aug to 27 Feb (ASR), with a single later record, 27 Mar 2005 (AH). Usually in small numbers, but up to 12 in Mole marsh 16–18 Oct 2004 (RD).

Sarkidiornis melanotos Knob-billed Duck. AM. One record, of three in Jan 1967 or 1968 (Maze 1971).

Nettapus auritus Pygmy Goose. Listed as resident by GS, but not seen by him in five months. More likely an irregular visitor: the only dated records (both from Mole marsh) are of a pair sometime Jan–Mar (Wilson 1993) and two pairs apparently prospecting old trees, 22 Aug 1968 (Harvey & Harrison 1970).

Accipitridae

**Aviceda cuculoides* African Cuckoo Hawk. Treated as AM in GS, but perhaps an uncommon resident. We saw a pair near the motel Aug and Mar, and one further north (Brugbani, Aug). The only other dated record is 16 Mar 2003 (ASR).

Pernis apivorus Honey Buzzard. PM. One acceptable record, 8 Oct 1975 (RBP; Grimes 1987), one possible, 20 Sep (Genelly 1969).

Elanus caeruleus Black-shouldered Kite. One 27 Feb 2003 (ASR); one sometime Jan–Mar (Wilson 1993). A skin collected in Mole (Grimes 1987: 241), has disappeared from the local museum. Requires extensive open grassland and unlikely to be more than a vagrant in Mole.

**Milvus migrans parasitus*. Yellow-billed Kite. AM. Rare in the rains (one sighting in five weeks, 22 Aug 2004), frequent by mid-Oct 2004 (RD), with extreme dates late Jul (Harvey & Harrison 1970) to Apr (Maze 1971). One report of a probable Palearctic Black Kite *M. m. migrans*, 5 Apr (Taylor & Macdonald 1978).

Haliaeetus vocifer African Fish Eagle. Considered resident by GS, and used to nest on occasion on the Samole below the motel (Greig-Smith 1977b), but has not done so in recent years (wildlife guards). No sightings in 2004–5; one passing through, 29 Jan 2008 (TTE). Has become rare in Ghana, following the damming of the Volta.

**Gypohierax angolensis* Palm-nut Vulture. Widespread from Old Ducie south; usually near riparian forest or water. Seen eating *Raphia* nuts at Konkori. Up to four

adults and three immatures in Mole marsh, Aug–Sep 2004. Fairly common even though *Elaeis* and *Raphia* palms are few in the south of the park.

**Necrosyrtes monachus* Hooded Vulture. Common (small numbers) throughout.

**Gyps africanus* African White-backed Vulture. Common and widespread, up to seven near motel (rains 2004) and over 20 near Nyanga, 8 Mar 2005.

**Trigonoceps occipitalis* White-headed Vulture. Frequent: one or two pairs near motel, also from Nyanga to southern boundary.

**Circaetus beaudouini* Beaudouin's Snake Eagle. AM?. A pair seen at close range over the Konkori scarp, 7 Mar 2005. Also observed 10–11 Feb 2003 (RC) and 3 Apr 2007 (AH). Harvey & Harrison (1970) reported a pair on several occasions up to mid-Aug near the motel: the dates suggest this species, and not the Palearctic *C. gallicus* (as in GS), separable with difficulty and often considered conspecific.

C. gallicus Short-toed Snake Eagle. PM. Sightings 31 Mar (Wink 1976, Grimes 1987), 5 and 8 Apr (Macdonald 1978a), if correctly identified. Macdonald (1978a) wrote that it is possible that some of his records referred to *C. beaudouini*.

**C. cinereus* Brown Snake Eagle. Uncommon: one motel scarp 24 Aug; recent dry-season reports (RC, ASR).

**C. cinerascens* Western Banded Snake Eagle. Adults in display flight over the Konkori scarp, 7 Mar 2005, and over the Lovi, 11 Mar. A probable breeding pair 27–29 Mar (Grimes 1987); observed 20 Apr (ASR & DH) and in Jun (JFW). GS treated it as a rare resident in riverine situations, a comment erroneously changed by Grimes (1987) to “occasionally in wet season”.

**Terathopius ecaudatus* Bateleur. Common throughout.

**Polyboroides typus* African Harrier Hawk. Uncommon, at Old Ducie, Konkori, Jang and Lovi.

Circus aeruginosus Eurasian Marsh Harrier. PM. Seen 16 Oct 2004 (RD), 8–9 Feb (Plat 1997), 27 Feb 2003 (ASR) and 26 Mar 2005 (AH).

Melierax metabates Dark Chanting Goshawk. The only records are of one near the motel, 14 Aug 1968 (Harvey & Harrison 1970) and singles 25 Feb (RC) and 27 Feb (ASR). GS attributed a record to M. Edmunds and L. Grimes, but this was not repeated in Grimes (1987).

M. gabar Gabar Goshawk. Uncommon, several reports, including melanistic individuals (Genelly 1969, RD).

**Accipiter ovampensis* Ovambo Sparrowhawk. AM. One below the motel, 14 Mar 2005. A melanistic bird reported, 16 Mar (Riley 2004).

**A. badius* Shikra. Treated as AM by GS, but more likely an uncommon resident. Seen on both visits, Old Ducie, Samole.

**Butastur rufipennis* Grasshopper Buzzard. AM. Typically a dry-season visitor attracted to grass fires. Seen by GS (no dates given, but Jul–Aug most unlikely). Dated records Feb (RC, ASR), 13 Mar (pers. obs.), 3 Apr (AH) and up to 35 birds at a fire sometime Jan–Mar (Wilson 1993).

**Kaupifalco monogrammicus* Lizard Buzzard. The commonest small raptor in woodland and riparian forest; vocal (strongly territorial).

**Buteo auguralis* Red-necked Buzzard. Listed as AM by GS, but probably resident. One over the motel scarp 7 Aug; common over the Konkori scarp, Mar. Greig-Smith (1977b) had birds displaying in Nov, Sutton (1970) saw one 19 Dec, and ASR several times Feb–Apr.

Aquila wahlbergi Wahlberg's Eagle. Considered resident by GS and Grimes (1987), but perhaps essentially AM, with the main breeding grounds in southern and E Africa (Brown *et al.* 1982, Meyburg *et al.* 1995). Dated records are Aug (Harvey & Harrison 1970, Dutson & Branscombe 1990), Sep 2006 (KV) and sometime Jan–Mar (Wilson 1993).

A. rapax Tawny Eagle. AM. Considered resident by GS although he did not see any himself. In Ghana, mainly a dry-season visitor, from Dec (Grimes 1987); additional data by JFW (nine records) and others (DH, ASR, DS) are all Oct–May. Dated records in Mole are Feb (Baha el Din & Baha el Din 1996) and one sometime Jan–Mar (Wilson 1993). Aug records by Harvey & Harrison (1970) seem odd and may not be correct.

**Hieraaetus spilogaster* African Hawk Eagle. Appears widespread: seen over the motel scarp, at Mognori, Brugbani (pair calling) and Jang (all Aug); a pair carrying prey over Konkori scarp, 7 Mar, was probably nesting.

H. pennatus Booted Eagle. PM. Only record is a dark phase individual, 10 Feb 2003 (Cruse 2003).

**H. ayresii* Ayres's Hawk Eagle. One (with a pale face) seen closely twice over the motel scarp Aug–Sep. Also reported Feb–Mar (RC, AH, ASR).

Lophaetus occipitalis Long-crested Eagle. Few records: GS, Wilson (1993), JFW (in Dec 1971).

**Polemaetus bellicosus* Martial Eagle. Uncommon. Used to breed just below the motel (wildlife guards) but stopped several years ago.

Sagittariidae

Sagittarius serpentarius Secretary Bird. Not resident (as reported in GS, who did not see it but gave one undated report), but vagrant. Wilson (1993) saw it only once in three months (Jan–Mar); reported by some wildlife guards from bovalls.

Falconidae

**Falco naumanni* Lesser Kestrel. PM. Small passage northward in 2005: five flying north 13 Mar, one 15 Mar. Some 50 birds reported in Jan 1968, including 20 at a bush fire on 7 Jan (Maze 1971).

F. tinnunculus Common Kestrel. Treated as both AM and PM by GS, but status requires clarification. Two over the motel scarp, early Sep (Harvey & Harrison 1970); one specimen (Grimes 1987: 241); singles seen 14 Feb 2003 (RC) and 17 Mar 2003 (ASR). Greig-Smith (1977a) mentioned records Oct–Dec, but they included Nov–Dec records credited to Sutton (1970), which were not from Mole but from Tumu, in the far north of Ghana.

**F. alopex* Fox Kestrel. One calling, rocky outcrop on the Konkori scarp, 7 Mar 2005. Plat (1997) mentioned one at the motel, early Feb 1997, but probably a wanderer there: suitable rocky outcrops or cliffs are not present in the south.

**F. ardosiaceus* Grey Kestrel. Singles or pairs seen regularly in Mole floodplain and woodland.

**F. chicquera* Red-necked Falcon. We saw only one, at the motel scarp, Aug; few other reports, including Feb–Mar (Harvey & Harrison 1970, RC, ASR).

**F. cuvierii* African Hobby. Few records: GS; one 8 Mar (Samole, pers. obs.); a sub-adult photographed 20 Apr 2002 (ASR & DH).

F. subbuteo Eurasian Hobby. PM. Singles, 6 Apr (Taylor & Macdonald 1978), 27 Mar 2005 (AH).

**F. biarmicus* Lanner Falcon. One near motel, 15 Aug 2004; one seen 9 Apr (Taylor & Macdonald 1978); Feb (RC); Mar (ASR).

Phasianidae

**Francolinus albogularis* White-throated Francolin. Avoids floodplains but common in woodland and edge of bovals. Noisy in the rains (Aug), but already singing in Mar, just before or with the first storms. Not recorded mid–Oct (RD) when perhaps silent.

**F. bicalcaratus* Double-spurred Francolin. Very common, woodland and grassland.

Coturnix chinensis Blue Quail. AM. Moist grassland, treated as resident by GS, but unlikely to be more than a rainy season visitor (Grimes 1987), as there is no suitable habitat in Mole in the dry season. Dry-season reports by Maze (1971) and Wilson (1993) therefore seem doubtful, given the added difficulty of identifying this species. Greig-Smith's undated records would have been between Jul and Nov.

**Ptilopachus petrosus* Stone Partridge. Very common, any woodland, grassland, riparian and dry *Anogeissus* forest.

**Numida meleagris* Helmeted Guineafowl. Abundant near the motel, less in evidence elsewhere.

Rallidae

**Amaurornis flavirostris* Black Crake. Local: a few in Mole marsh, at pools with herbaceous (Mognori) or wooded vegetation (Nyanga, Lovi, Haraba-Haraba).

**Porphyryla alleni* Allen's Gallinule. AM. Harvey & Harrison (1970) reported it frequently in Mole marsh in the rains (Jul–Sep), and Maze (1971) from Apr; small numbers seen by GS. Probably decreased, with over-grazing of the Mole marsh: only one seen in Mole marsh twice in Aug 2005.

**Gallinula chloropus* Common Moorhen. A pair near Mognori (permanent pool) Mar. Also reported from Mole marsh (GS) and Asibey's pools (Wilson 1993).

Gruidae

Baelearica pavonina Black Crowned Crane. Two records: in the 1960s (GS); one bird at Lovi, 15 Oct 1975 (R.B. Payne in GS and *in litt.*). Now very rare in W Africa.

Heliornithidae

**Podica senegalensis* African Finfoot. Two under tree cover in the Mole river, Mognori (Aug 2004). A young one found drowned in a fishing net in the same area,

17 Oct 2004 (RD). Seen further upstream, north to Asibey's pools (Mar 2005): one disturbed from a tree and cautiously came back to it, perhaps nesting. Five seen from helicopter on the Mole river, 19 Jan 1990 (JFW).

Otididae

**Neotis denhami* Denham's Bustard. AM. Uncommon dry-season visitor, with extreme dates 17 Dec 1971 (JFW) and Apr (Maze 1971). Wilson (1993) saw single birds on three occasions, Jan–Mar. One in burnt grass, 13 Mar 2005.

**Eupodotis melanogaster* Black-bellied Bustard. GS did not see any in the rains and treated it as AM; but more likely a rare resident. We saw a male on a boval (Brugbani), 8–22 Aug, looking alarmed: kept coming back to same area (nesting female?).

Rostratulidae

Rostratula benghalensis Painted Snipe. Vagrant: a male caught, 8 Apr 1976 and two seen next day (Taylor & Macdonald 1978). Four females, 12 Feb 2003 (RC).

Jacanidae

**Actophilornis africanus* African Jacana. Locally common: several pairs on water-lilies at Mognori pool. A pair with young (3/4 size) at Asibey's pool, Mar. In Mole marsh numbers fluctuate with amount of water.

Recurvirostridae

Himantopus himantopus Black-winged Stilt. Four present for several days in Mole marsh (Wilson 1993). Known by wildlife guards as an occasional visitor.

Burhinidae

**Burhinus senegalensis* Senegal Thick-knee. AM. Very common in dry grassland near the dams below the motel, Mar 2005. Up to 12 calling at night there, 27 Feb to 20 Apr (ASR). Heard on the Mole river at Nyanga. All dated records are Jan–Apr, but likely to arrive before (recorded mainly from late Oct in the north of the country: Grimes 1987).

**B. capensis* Spotted Thick-knee. AM. No records Aug–Sep, but several calling in open, dry woodland near Nyanga camp, and Brugbani boval, 7–9 Mar. Probably only in the dry season, as suggested by Grimes (1987).

Glareolidae

Pluvianus aegyptius Egyptian Plover. Vagrant: two at pools below the motel sometime Jan–Mar (Wilson 1993); there was at one time a specimen in the collection at Samole (Grimes 1987).

Rhinoptilus chalcopterus Bronze-winged Courser. AM. Three specimens 31 Dec to 19 Mar (Grimes 1987: 242); sight records on the road at night, late Mar (Sutton 1965).

Cursorius temminckii Temminck's Courser. AM. A group of 11 on the playing field at Samole sometime Jan–Mar (Wilson 1993); a group of four at the same place in a later year (ZW).

Charadriidae

Charadrius pecuarius Kittlitz's Plover. Still only one record (GS) in the rains of 1974 or 1975.

**C. forbesi* Forbes's Plover. Although recorded from "marsh" by GS, we saw this species only on bovals. Three pairs in Aug, one with a full-grown immature; a fourth male alarm-calling in such a way that nesting female suspected. We did not see any in Mar, but probably resident with local movements: there are records Dec–Jan (Sutton 1970), Mar (Wilson 1993, JFW), Apr (Maze 1971). Breeding Jul–Aug: one chick 25 Aug (Greig-Smith 1977b); a clutch of three on a boval, Aug 1991 (Wilson 1993).

**Vanellus senegallus* African Wattled Lapwing. Fluctuating numbers in Mole marsh: 1–2, early Aug 2004; up to six, mid-Oct (RD), several pairs and alarm-calling, Mar. Also Nyanga camp, Mar, and other records Jan–Apr (several observers). "Nesting" Jul on bovals (Greig-Smith 1977b).

V. albiceps White-headed Lapwing. Two at Nyanga on the Mole river, 20 Dec 1968 (Sutton 1970), is still the only record.

V. spinosus Spur-winged Lapwing. Irregular visitor: the only dated report is one at Mole marsh, 27 Feb 2003 (ASR). There are other, undated, acceptable reports from wildlife guards from same area.

V. lugubris Lesser Black-winged Lapwing. Two by the pools below the motel, 27 Feb 2003 (ASR).

Scolopacidae

**Gallinago gallinago* Common Snipe. PM. One in sedges at Asibey's pools, 13 Mar 2005. Listed by Greig-Smith (1977a) on several dates in Nov.

G. media Great Snipe. PM. A specimen from Mole was apparently collected in Oct (Greig-Smith 1977a, Grimes 1987).

Numenius phaeopus Whimbrel. PM. Three reported seen and heard in flight over the motel, 21 Aug 1968 (Harvey & Harrison 1970) (not Sep, *pace* Greig-Smith 1977a).

Tringa stagnatilis Marsh Sandpiper. PM. Reported by Greig-Smith (1977a) in late Nov.

T. nebularia Greenshank. PM. Reported by Greig-Smith (1977a) in early Dec.

**T. ochropus* Green Sandpiper. PM. Several at pools, throughout the park, 6–14 Mar 2005. Reported 19 Dec (Sutton 1970) and 17 Mar (ASR).

**T. glareola* Wood Sandpiper. PM. From 27 Jul (Harvey & Harrison 1970) but only once in Aug 2004 (small group 14–15 Aug). Two at Asibey's pools, 10–13 Mar, seems to be the latest recorded date.

**Actitis hypoleucos* Common Sandpiper. PM. Greig-Smith (1977a) noted birds from 29 Jul to mid-Nov; late Jul is a normal arrival date of birds from Eurasia, and not a sign of over-summering, as he suggested. Single by Dam 1, 2 Sep 2004; singles at pools at Nyanga and below motel, 8–14 Mar. Latest report 3 Apr (AH).

Philomachus pugnax Ruff. PM. Reported by Greig-Smith (1977a) in early Dec.

Pteroclididae

**Pterocles quadricinctus* Four-banded Sandgrouse. AM. Common dry-season visitor, well known to wildlife guards. Several pairs coming to drink at dusk at pools throughout the park, 5–13 Mar. Sutton (1970) found it "numerous" Dec–Jan and Greig-Smith (1977a) presumably saw it on his Nov visit (unlikely on his other visits, Jul–Aug). Latest record 26 Mar (2005, AH).

Columbidae

Streptopelia turtur European Turtle Dove. PM. Singles collected in Mole 12 Oct and 12 Nov 1971 (Walsh & Grimes 1981); Greig-Smith (1977a) had records in the second half of Nov and early Dec. No records since.

**S. senegalensis* Laughing Dove. Common near habitation (Samole) and all bush camps.

S. decipiens Mourning Dove. Status uncertain. Listed by GS as a rare resident, but there are no other documented reports: may have been an irregular visitor in the 1970s. Maze (1971) listed it, but as he did not mention the common *S. vinacea*, his could have been misidentified; similarly, Harvey & Harrison (1970) saw some only in flight, which leaves doubt as to the identification. Grimes (1987) lists no other records from the north of Ghana, but JFW saw some occasionally in the northeast 1971–6.

**S. vinacea* Vinaceous Dove. Commonest dove species, throughout woodland and other vegetation. Greig-Smith (1977a) considered there were very few Jun–Sep (which was not the case in 2004), with numbers greatly augmented in the dry season, and a huge influx then is supported by Taylor & Macdonald (1978).

S. roseogrisea African Collared Dove. Two, “well seen” on 5 Apr 1976 (Taylor & Macdonald 1978), were exceptional vagrants from the Sahel. The only record for Ghana.

**S. semitorquata* Red-eyed Dove. Common, especially in riparian formations and *Anogeissus* groves (floodplains).

**Turtur abyssinicus* Black-billed Wood Dove. Very common throughout, woodland and riparian vegetation.

**T. afer* Blue-spotted Wood Dove. Confined to riparian thickets and forest, throughout but especially common on the Konkori scarp, thus more local than *T. abyssinicus*.

Oena capensis Namaqua Dove. AM. GS has two undated records (one, by N.C. Davidson, would be in the rains of 1974 or 1975), including a specimen. One near motel, 27 Mar 2005 (AH).

**Treron waalia* Bruce’s Green Pigeon. Mostly in the south of the park, with largest numbers feeding on fruit of *Ficus platyphylla* and *F. ingens* below the motel (Aug–Sep). Fewer in Mar.

**T. calvus* African Green Pigeon. More widespread than last (throughout the park); flocks feeding with it on same fruiting figs, but also on ripe fruit of *Nauclea latifolia*, *Vitex doniana*, *Cissus populnea*.

Psittacidae

**Poicephalus robustus* Brown-necked Parrot. Locally in pairs or family groups (of four) in the south, feeding on the last fruits (seeds) of *Daniellia oliveri*, Aug 2004. GS considered it resident, but we saw none in Mar 2005, and no doubt it is subject to at least local movements.

**P. senegalus* Senegal Parrot. Common throughout, feeding on seeds of *Daniellia* and of *Mitragyna*.

**Agapornis pullarius* Red-headed Lovebird. Uncommon in riparian situations. A male feeding a begging immature on the edge of Haraba-Haraba pool, Aug. Noted late Mar (AH).

**Psittacula krameri* Rose-ringed Parakeet. Very common, often in small flocks. A pair investigated a broken stump of a *Khaya*, 1 Sep 2004. Very fond of seeds of *Margaritaria* (*Phyllanthus*) *discoidea* (Kananto forest).

Musophagidae

Tauraco persa Green Turaco. Considered resident by GS, but probably only an occasional wanderer from further south (it is common in Bui NP to the southwest, north to 8°47'N). Occasionally seen by wildlife guards, last recorded in the dry season of 2002 in thin riparian forest below the motel (ZW).

**Musophaga violacea* Violet Turaco. Widespread in riparian forest, wooded floodplain, thicket clumps in woodland. Fond of figs and other fruit (e.g. *Vitex doniana*).

**Crinifer piscator* Western Grey Plantain-eater. Very common throughout, woodland and riparian formations. Fond of fruit (including *Nauclea latifolia* close to the ground) and also especially of the young foliage of *Daniellia oliveri*.

Cuculidae

Clamator jacobinus Jacobin Cuckoo. AM. White-breasted birds reported four times Jul–Sep (Harvey & Harrison 1970), also seen by GS (undated).

**C. levaillantii* Levaillant's Cuckoo. AM. Listed as resident by GS, this is actually a rains visitor: not arrived in Gbele Wildlife Reserve (just to the north) by 5 Mar 2005 (pers. obs.), but one calling in the north of Mole (Old Ducie) 5 Mar, and several on later dates further south; common Apr (ASR & DH). Widespread and noisy in dense woodland, riparian forest and wooded floodplain, Aug–Sep. Still calling 16–18 Oct (RD). No records Dec–Feb.

**Pachyococcyx audeberti* Thick-billed Cuckoo. Two calling birds in riparian forest at Mognori on the Mole, 27 Aug 2004; further north at "Office Loop", 10 Mar 2005. Two reported 25 Feb 1996 (Baha el Din & Baha el Din 1996).

**Cuculus solitarius* Red-chested Cuckoo. AM. Not reported before 2004, but voice known to ZW and other guards. Widespread in the rains, especially in riparian forest and edge of floodplain: commonly heard around the motel and elsewhere in the south, but not at Ducie. Singing activity decreased during Aug, with fewer calling early Sep.

**C. clamosus* Black Cuckoo. AM. Singing in several places from 8 Mar, usually in riparian situations (Nyanga camp south to Mognori and Samole Loop). Possibly overlooked Aug–Sep because of lack of calls. Two heard, 9 Feb 2003 (R. Cruse *in litt.* and 2003) are exceptionally early for a savanna environment.

**C. gularis* African Grey Cuckoo. AM. Heard throughout the park, 5–15 Mar 2005; other sound records 27 Feb to 20 Apr (ASR). Silent Aug, but one seen 21 Aug. Not recorded with certainty by GS, and unlikely to call Jul–Sep.

**Chrysococcyx klaas* Klaas's Cuckoo. Treated as AM by GS, but more likely resident, singing at both seasons (rains and Mar). Also recorded Oct (Greig-Smith

1977b), Jan (Maze 1971) and Apr (AH, ASR & DH). Widespread in riparian situations, throughout.

**C. caprius* Didric Cuckoo. AM. Widespread in riparian situations and floodplains. Conspicuous Aug–Sep (when its ploceid hosts were breeding), one chased by a *Euplectes hordeaceus* at Jang. Already calling below the motel 9 Mar, and on the Lovi 11 Mar. Still noisy mid–Oct (RD). Duration of dry season absence uncertain.

**Ceuthmochares aereus* Yellowbill. At least two calling and seen in liane tangles and dense canopy in riparian forest at Mognori, Aug 2004, are the first records for Mole. Not found further north in Ghana.

Centropus grillii Black Coucal. AM. GS considered it resident in small numbers, but probably a rainy season visitor. One reported 8 Aug 1988 (Dutson & Branscombe 1990). No subsequent records, and unknown to the wildlife guards.

**Centropus senegalensis* Senegal Coucal. Very common, all habitats.

Tytonidae

**Tyto alba* Barn Owl. Heard at Jang (Sep) and Asibey's pools (Mar). Formerly known only from a road-kill skin (Harvey & Harrison 1970, GS).

Strigidae

**Otus senegalensis* African Scops Owl. Throughout, woodland and *Anogeissus* forest. Very vocal in Mar, calling less Aug–Sep.

**O. leucotis* White-faced Owl. Locally in woodland (Mole airstrip, Nyanga) and *Anogeissus* forest (Mognori).

**Bubo africanus* Spotted Eagle Owl. Widespread from Konkori scarp southwards: rocks, open woodland, edge of roads.

B. lacteus Verreaux's (Giant) Eagle Owl. An adult seen Mar 1993 (Helsens 1996), no locality given, is the only record. An "almost certain" sighting of one on the Damongo scarp (Harvey & Harrison 1970) became "a certain sighting Mole" (Grimes 1987), but Damongo is outside the park.

**Scotopelia peli* Pel's Fishing Owl. First reported in 2003 (Cruse 2003, ASR). An immature calling at dawn and dusk at Dam 2, 7 Sep 2004, suggests post-breeding dispersal. Occasionally seen there in the rains by wildlife guards (not in the dry season once the Samole stream dries up). Observed by day on the Mole (adult with immature) and Lovi rivers (one roosting in a *Diospyros mespiliformis*), Mar 2005.

**Glaucidium perlatus* Pearl-spotted Owlet. A few in woodland and riparian forest throughout, but especially common at Jang, where *Acacia* spp. are frequent.

Caprimulgidae

**Caprimulgus pectoralis (nigriscapularis)* Fiery-necked Nightjar. Three feeding over Dam 1 at dusk, 31 Aug 2004: short tail, squat silhouette and well-marked white patch in wing. Whistled song well known to several wildlife guards. Song not heard in Aug–Sep or Mar, but imitated by resident *Cossypha albicapilla* at Kananto.

**C. tristigma* Freckled Rock Nightjar. Not listed by GS, although Sutton (1970) reported it from Konkori scarp, where it was common, Mar. One singing around the motel, Aug–Sep, more frequently in Mar, often from the roof of the chalets, and

occasionally drinking from the motel pool. Present around the motel from at least 2003 (RC, ARS).

**C. climacurus* Long-tailed Nightjar. Not singing in the rains but one seen at Brugbani, 22 Aug. Widespread in Mar, when singing.

**Macrodipteryx longipennis* Standard-winged Nightjar. AM. Not reported in the peak of the rains (Jul–Sep) and its inclusion in GS (as his own record) may be based on his Nov visit. Otherwise known to occur from at least Jan (Macdonald 1979) to Apr (Maze 1971). Widespread (Old Ducie to Samole), in small numbers, Mar; up to four males on airstrip mid-Mar (ARS).

Apodidae

**Telacanthura ussheri* Mottled Spinetail. Very local, probably because Baobabs (a favourite nesting tree) are uncommon in Mole. Singles or pairs seen at Jang (around a Baobab), on the southwest boundary, Sep, and at Nyanga, Mar. Harvey & Harrison (1970) saw it at Lovi.

**Cypsiurus parvus* Palm Swift. Widespread in small numbers (nests in *Borassus* palms).

Apus pallidus Pallid Swift. PM. Not in GS, but two on 19 Dec 1971 (Walsh in Walsh & Grimes 1981).

**A. apus* Eurasian Swift. PM. Recorded irregularly in small numbers on double passage: from 7 Aug (pers. obs.) to early Nov (Greig-Smith 1977a), and Mar–Apr. In 2005 first noted 15 Mar; last date 21 Apr (ASR & DH).

**A. affinis* Little Swift. Not noted on buildings by GS, but a few pairs had been breeding on the motel shower block for some years, attending nests in Mar and Aug.

**A. caffer* African White-rumped Swift. Very local, treated as AM by GS, but we observed it Mar and Aug, albeit more often in the rains, when several pairs were flying around culverts on the southern boundary road; a group of seven, 13–14 Aug, probably contained juveniles. At least one on the Konkori scarp, Mar.

**A. horus* Horus Swift. At least two on the southern boundary road, 13 Aug 2004, next to *A. caffer*. Identified by moderately forked tail but more extensive white on the rump than *A. caffer*. One low over water at Dam 1, 9 Mar 2005. First records for Ghana (Dowsett *et al.* in press).

Trogonidae

**Apaloderma narina* Narina's Trogon. Discovered in Aug 2004 in tall-canopy forest at Degbere, Mognori, Kananto, and near the Lovi river; also in thicket, edge of boval at Brugbani. Very noisy in Aug, not heard in Mar.

Alcedinidae

**Alcedo quadribrachys* Shining Blue Kingfisher. Only on well-wooded sections of the Mole river, from Nyanga to Mognori, both seasons.

**A. cristata* Malachite Kingfisher. Small numbers by streams and pools, throughout.

**Ceyx pictus* African Pygmy Kingfisher. Treated as resident by GS (his visits Jul–Nov), but probably mainly a rains visitor (AM), already common in Mar, from late Feb (ASR). Widespread in riparian situations, thicket clumps in floodplains and edge of bovals.

**Halcyon leucocephala* Chestnut-bellied Kingfisher. AM. Common dry season visitor, from Nov (Grimes 1987) to at least 21 Apr (ASR & DH). No records in the peak of the rains, except one reported 3 Aug (Harvey & Harrison 1970). In any woodland, but often near river banks where breeding.

**H. malimbica* Blue-breasted Kingfisher. Common in riparian forest and woodland, even on small streams (Brugbani), *Anogeissus* groves, throughout.

**H. senegalensis* Woodland Kingfisher. AM. A rains visitor, nesting Jul–Aug (Greig-Smith 1977b). Less common than *H. malimbica*, edge of riparian forest. Not seen in Mar, and all dated records Jul–Oct, but likely to arrive by May if not earlier (Grimes 1987).

**H. chelicuti* Striped Kingfisher. Apparently more widespread in Mar (any woodland) than in the rains, when most conspicuous in the motel area: perhaps subject to local movements away from woodland with very tall grass.

**Megaceryle maxima* Giant Kingfisher. A few on large pools on the Mole and Lovi rivers. Occasionally visits the Samole stream (motel area) in the rains.

Ceryle rudis Pied Kingfisher. Uncommon visitor to pools below motel: GS (undated), up to three reported by Genelly (1969) late Aug to Sep, one on 17 Oct 2004 (RD).

Meropidae

**Merops pusillus* Little Bee-eater. A few pairs locally near water and in flooded grassland.

**M. hirundineus* Swallow-tailed Bee-eater. At least a partial AM in Ghana, moving south in the dry season (Grimes 1987), but patterns of movement not clear at Mole. Present in small numbers in the main rains (several observers), singles Oct (Genelly 1969) and Dec (Sutton 1970, JFW), a few Feb 1979 (JFW). Uncommon Mar 2005 (a few Konkori to Nyanga). In any woodland.

**M. bulocki* Red-throated Bee-eater. Many nests occupied (feeding young) in sandbanks on the Mole at Nyanga and Samole, Mar 2005. More widespread in the rains, throughout open areas.

M. albicollis White-throated Bee-eater. AM. Double passage (to and from breeding grounds in the Sahel): only dated records are of flocks, 16–17 Oct 2004 (RD) and 20 Apr 2002 (ASR & DH). No dates given in Greig-Smith (1977a).

**M. apiaster* European Bee-eater. PM. Double passage: a small group on passage south 7 Sep 2004; recorded mid-Oct (Greig-Smith 1977a). Passage north started 8 Mar 2005, with more 12 Mar, still passing 28 Mar (AH).

**M. nubicus* Northern Carmine Bee-eater. AM? There was a well-known breeding colony (Grimes 1987), on the Mole river just north of Nyanga camp, reported late Mar 1964 (Sutton 1965) and presumably the same one with some 24 nests and 100 birds in early 1993 (Wilson 1993). This colony deserted (nest holes still present) Mar 2005, but likely still breeds in the area, in scattered pairs or small groups. Pairs occasionally seen on the Lovi, at the edge of bovals (Brugbani) and dry Samole stream. Dated records mid-Aug (Harvey & Harrison 1970) to Apr (Maze 1971), but probably rare in the rains (Grimes 1987) and we had none Aug to early Sep.

Coraciidae

Coracias garrulus European Roller. PM. Singles 17 Mar 2003 (ASR) and 6 Apr 1976 (Taylor & Macdonald 1978).

**C. abyssinicus* Abyssinian Roller. AM. Apparently dry season visitor, dated records between 16 Oct (RD) and 21 Apr (ASR), with one reported 7 Aug (Dutson & Branscombe 1990). We had no records Aug–Sep, but found it common in Mar. Maze (1971) saw 50 at a bush fire, 7 Jan 1968.

**C. naevius* Rufous-crowned Roller. AM. Small numbers between at least 8 Feb (Plat 1997) and 20 Apr (ASR). Widespread from Gbanwele camp to Samole, Mar 2005.

**C. cyanogaster* Blue-breasted Roller. Likely resident in small numbers, rather than a passage migrant as claimed by Greig-Smith (1977a). One in woodland at Ducie, another near Brugbani, Aug. Harvey & Harrison (1970) saw a group of four in the rains, while RC reports it for Feb and RD for Oct.

**Eurystomus glaucurus* Broad-billed Roller. AM. Treated as resident by GS, but “wholly migrant” by Greig-Smith (1977a), based on wildlife guards’ records Mar–Aug, Dec. Silent Aug–Sep 2004, but up to 10 feeding at dusk over pools; several records Oct (Genelly 1969, RD). Numbers seemed to be increasing over the period 5–15 Mar 2005, when very noisy. Usually in riparian situations.

Phoeniculidae

**Phoeniculus purpureus* Red-billed Wood Hoopoe. Widespread and common in woodland and riparian forest.

**P. aterrimus* Black Wood Hoopoe. Widespread in woodland, less common than last. Resident in GS, but considered migratory (moving south out of Mole) by Taylor & Macdonald (1978), because they had no records in early Apr 1976. This was misinterpreted by Grimes (1987) as “moved south into Mole at the end of the dry season”. Widespread in Mar (pers. obs) and Apr (ASR), and we do not feel Taylor & Macdonald’s suggestion is correct.

Upupidae

**Upupa epops* Hoopoe. AM/PM. None Aug–Sep 2004; a few calling in dry woodland near Brugbani and Samole (referable to the African population), Mar. A few other dry season records apparently involve both African and Palaearctic birds (GS, Taylor & Macdonald 1978, Wink 1976), although the latter are likely to be rare this far south. Extreme dates 10 Dec (Sutton 1970) to 7 Apr (Taylor & Macdonald 1978).

Bucerotidae

**Tockus erythrorhynchus* Red-billed Hornbill. First report was two birds 7–9 Aug 1988 (Dutson & Branscombe 1990); known to wildlife guards for several years. We found singles or pairs in *Anogeissus* floodplain below the motel and at the edge of bovals near Brugbani (Aug and Mar); also in woodland near Ducie and Jang.

**T. nasutus* African Grey Hornbill. AM. Only three records of singles Aug–Sep 2004. Passage of loose flocks of up to 20, 17–23 Oct (Genelly 1969) and 16–18 Oct 2004 (RD). Very common throughout in Mar; other records Jan–Apr (several observers).

**Bucorvus abyssinicus* Abyssinian Ground Hornbill. Widespread in small numbers in woodland (Old Ducie to Jang), and bovals (near Brugbani).

Lybiidae

**Pogoniulus chrysoconus* Yellow-fronted Tinkerbird. Common in woodland and riparian forest throughout, calling both seasons. Seen eating figs and mistletoe berries.

**Lybius vieilloti* Vieillot's Barbet. Widespread in woodland.

**L. dubius* Bearded Barbet. Widespread in woodland and riparian formations. In addition to figs, seen feeding on fruit of *Nauclea* and *Cissus populnea*.

Indicatoridae

**Indicator indicator* Greater Honeyguide. Widespread in woodland; singing sporadically in Mar and early Aug 2004 but silent after 24 Aug. Only males, usually adults, seen guiding.

**I. minor* Lesser Honeyguide. More local than last, usually in riparian formations. Singing Mognori Aug, and Konkori Mar.

**I. willcocksii* Willcocks's Honeyguide. One singing in a 20 m *Khaya* in riparian forest on a stream down the Konkori escarpment, 7 Mar 2005. First record for Mole.

Picidae

Jynx torquilla Eurasian Wryneck. PM. Seen near the motel, early Nov 1975 (Greig-Smith 1977a); a specimen (Grimes 1987: 244), no longer in existence, was one shot on 22 Oct 1971 (JFW).

**Campethera punctuligera* Fine-spotted Woodpecker. Frequent and widespread in relatively tall woodland.

**C. abingoni* Golden-tailed Woodpecker. Confined to riparian forest, from Konkori south to Lovi, Mole and Samole rivers, Haraba-Haraba pool.

**Dendropicos fuscescens* Cardinal Woodpecker. Frequent in riparian forest (widespread), more rarely in very tall woodland (Degbere).

**Mesopicos goertae* Grey Woodpecker. Mainly in riparian forest or woodland, common in *Anogeissus* groves.

**Picoides obsoletus* Brown-backed Woodpecker. Frequent in mixed bird parties in woodland, especially in the south.

Alaudidae

**Mirafraga rufocinnamomea* Flappet Lark. Particularly common on bovals, uncommon elsewhere in woodland (Konkori to the south). Much display in Aug, very little in Mar, after first storms.

**Galerida modesta* Sun Lark. Common on all six bovals visited in the Brugbani area (Aug and Mar), and on the bovals between Gbanwele and Konkori (Mar). In groups of up to six. Listed by GS as Crested Lark *G. cristata* (see list of rejected species below).

Eremopterix leucotis Chestnut-backed Sparrow-Lark. AM. Listed as a rare migrant by GS, without dates, but "many seen throughout the reserve", 16–17 Feb 1979 (JFW). Reported 13 Feb 2003 (RC) and sometime Jan–Mar (Wilson 1993).

Hirundinidae

**Psalidoprocne obscura* Fanti Saw-wing. AM. Riparian situations throughout, at least Mar–Sep. Several family groups, with shorter-tailed immatures still interacting with

adults, Aug–Sep. Reported Jan (Maze 1971), but needs confirmation; ASR found none in Feb. A few pairs north to Konkori early Mar; small numbers late Mar to Apr (several observers).

**Riparia riparia* European Sand Martin. PM. Two with *Hirundo rustica* over Dam 1, 1 Sep 2004. Up to 200, Oct (Greig-Smith 1977a).

R. paludicola Plain Martin. Irregular visitor? Three, 3 Apr 1976, one next day (Taylor & Macdonald 1978). A report of 100–200, 10 Feb 2003 (Cruse 2003) is surprising and may have involved some *R. riparia* (RC *in litt.*).

Pseudhirundo griseopyga Grey-rumped Swallow. AM. Only records are a few flocks, probably 50–100 individuals in all, 4–9 Apr (Taylor & Macdonald 1978), and several pairs, Dec 1971 (JFW).

**Hirundo semirufa* Rufous-chested Swallow. Treated as AM by GS, but seen Aug and Mar: a few pairs around bovals (Brugbani) and one at pool at Old Ducie.

**H. senegalensis* Mosque Swallow. More widespread than last (both seasons), any woodland, Nyanga and Lovi to extreme south. Likely resident, not AM as in GS.

**H. abyssinica* Lesser Striped Swallow. Widespread around rocks (Konkori), culverts, pools in woodland. Nesting Aug (Dutson & Branscombe 1990). In the dry season occasionally drank in pools below the motel. Resident, not AM as in GS.

**H. daurica* Red-rumped Swallow. One pair seen at close range, including when resting in a tree, Konkori scarp, 7 Mar 2005. “Considerable numbers between 22 and 28 August” (Greig-Smith 1977a) is unusual and perhaps not this species. Genelly (1969) mentioned it but was not sure of his identification.

**H. preussi* Preuss’s Cliff Swallow *Hirundo preussi*. AM. About 15 with migratory *Delichon urbicum*, north of Asibey’s pools, 12 Mar 2005. Several at ponds below the motel, Dec 1971 (JFW).

**H. fuligula* Rock Martin. One pair around rocks, Konkori scarp, 7 Mar 2005. Listed by GS on the basis of Harvey & Harrison (1970), but their birds were on the Damongo scarp, outside the park.

**H. smithii* Wire-tailed Swallow. Pairs usually near water (on several rivers including Lovi and Mole), occasionally visiting dams below the motel (where breeds occasionally); also over bovals, around culverts on the southern boundary road and near Brugbani, where one pair breeding under a culvert, Aug. Probably resident, not AM as in GS.

H. leucosoma Pied-winged Swallow. GS listed it as a common migrant in moderate numbers, but the only dated records are of up to three birds from Mognori and the motel, late Jul to early Aug (Harvey & Harrison 1970).

**H. rustica* European Swallow. PM. Extreme dates of double passage are 30 Aug 1968 (Harvey & Harrison 1970) and 1 Sep (2004, when we saw at least 30) to early Nov (Greig-Smith 1977a), and 11 Mar (2005) until at least 20 Apr (ASR & DH).

**H. lucida* Red-chested Swallow. Listed as AM by GS, but probably resident: seen at both seasons, more widespread in the rains. Often near water.

**Delichon urbicum* House Martin. PM. On passage (Greig-Smith 1977a) from 23 Oct (Genelly 1969), but probably earlier, to 9 Apr (Macdonald 1978a). Flocks of several

hundreds in Nov (Greig-Smith 1977a), 750+ on 20 Dec (Sutton 1970) and 300–400 in Mar (Grimes 1987). Small numbers may winter (there is a Jan record of one, by Macdonald 1978a).

Motacillidae

Motacilla flava Yellow Wagtail. PM. Reported on several occasions from 5 Oct (Genelly 1969) to late Mar (Wink 1976).

M. aguimp African Pied Wagtail. Vagrant, Aug (Harvey & Harrison 1970), Oct (Grimes 1987). Appears as *M. alba* in GS.

Anthus leucophrys Plain-backed Pipit. Irregular visitor? We never found it on bovals, where GS saw small numbers. Occasionally in open grassland near the motel (late Jul to early Aug, Harvey & Harrison 1970, ZW).

**A. trivialis* Tree Pipit. PM. Winters late Oct (Greig-Smith 1977a) to 9 Apr (Macdonald 1978a); said to be common in the 1970s (GS), but only two singles in Mar 2005.

A. cervinus Red-throated Pipit. PM. Two birds, 5 Apr 1976 (Taylor & Macdonald 1978).

Macronyx croceus Yellow-throated Longclaw. One in Mole marsh, 20 Apr 2002 (ASR & DH). Rare in same area (ZW).

Campephagidae

**Campephaga phoenicea* Red-shouldered Cuckoo-shrike. AM. Considered resident by GS, later partial migrant, with numbers augmented in the rains (Greig-Smith 1977a). Common in the rains, in riparian formations throughout the park, *Anogeissus* groves, wooded floodplain and thickets. Rarely recorded in the dry season: one male, 13 Dec 1971 (JFW), only two sightings of single males, 11–12 Mar (pers. obs.), but common in Apr, including one yellow-shouldered male (ASR & DH).

**Coracina pectoralis* White-breasted Cuckoo-shrike. Local in tall woodland (five localities, from Old Ducie to the southern boundary).

Pycnonotidae

**Chlorocichla flavicollis* Yellow-throated Leaflove. Several pairs in moist riparian forest, Konkori scarp; more local to the south, in dense riparian forest on the Mole (Mognori, Office Loop).

**Pycnonotus barbatus* Common Bulbul. Very common throughout.

Turdidae

**Turdus pelios* West African Thrush. Common throughout woodland, riparian forest, around camps.

**Luscinia megarhynchos* Common Nightingale. PM. One record Mar (Greig-Smith 1977a); one, 8 Oct 1975 (RBP); one singing in thickets on the Mole (Nyanga), 8 Mar 2005.

**Cossypha niveicapilla* Snowy-crowned Robin Chat. AM/resident. GS considered it resident, but there is a clear influx in the rains. In Mar, widespread in small numbers in thick riparian vegetation (Old Ducie to Samole). Much more numerous in the rains, when it also occupies deciduous thickets then in leaf. Vocal imitations (Aug 2004) entirely of local birds: *Kaupifalco monogrammicus*, *Ptilopachus petrosus*, *Clamator levaillantii*, *Cuculus solitarius*, *Merops apiaster*, *Indicator indicator*, *Oriolus auratus*, *Malaconotus sulfureopectus*.

**C. albicapilla* White-crowned Robin Chat. More restricted ecologically than *C. niveicapilla*, to riparian forest with an evergreen element (where resident). Very common on the Lovi, Mole and Samole; numerous in riparian patches on the Konkori scarp. Dominates *C. niveicapilla* in evergreen (as on the Mole). Thought essentially non-imitative (Keith *et al.* 1992), but this is not always so: vocal imitations include songs of *Kaupifalco monogrammicus*, *Ptilopachus petrosus*, *Halcyon malimbica*, *Tockus nasutus*, *Caprimulgus pectoralis*, *Indicator indicator*.

Phoenicurus phoenicurus Common Redstart. PM. GS listed it based on a record by Sutton (1970), but this was from Tumu. Few records; normally winters further north: one male 17 Feb 1979 (JFW), one male in Mar 1993 (Helsens 1996) and another 26 Feb 2002 (Cruse 2002).

Saxicola rubetra Whinchat. PM. Wintering Dec–Mar (Greig-Smith 1977a, Macdonald 1978a); probably scarcer now, with one recent record, 26 Mar 2005 (AH).

**Cercomela familiaris* Familiar Chat. Very conspicuous on the Konkori scarp (where also reported by Sutton 1970). A pair seen occasionally around buildings at the motel.

**Myrmecocichla albifrons* White-fronted Black Chat. Woodland, uncommon to locally common north of Brugbani.

**M. cinnamomeiventris* Mocking Chat. Seems confined to rocky woodland on the Konkori scarp. Not listed by GS, though reported from Konkori by Sutton (1970).

Sylviidae

**Melocichla mentalis* African Moustached Warbler. Common in tall grass, usually near water, in floodplain and wooded grassland.

**Acrocephalus schoenobaenus* Sedge Warbler. PM. First record, one on 27 Feb 2003 (ASR). Several seen and heard calling in sedges on the permanent Sabory pool near Mognori, 13 Mar 2005. This is the only good habitat for this species at Mole, and it could be expected to winter there.

**A. scirpaceus* European Reed Warbler. PM. A few, early Oct to early Nov (Greig-Smith 1977a); one singing in thicket on the Mole river, Nyanga, 8 Mar 2005.

**Hippolais polyglotta* Melodious Warbler. PM. Small numbers in early Nov (Greig-Smith 1977a), Feb (RC), late Mar (Walsh & Grimes 1981) and 3 Apr (AH). We found it common (in song) in the south of the park, north to Lovi, in woodland, edge of riparian forest, thickets, *Anogeissus* groves, Mar 2005. Although Grimes (1987) quoted Greig-Smith (1977a) as giving records Oct–Apr, especially in closed canopy at “sites of abandoned villages”, these details are not in the reference cited.

**H. (pallida) opaca* Western Olivaceous Warbler. PM. First report, one on 27 Feb 2003 (ASR). Two singing in a small grove of *Acacia sieberiana* in Konkori camp, 7 Mar 2005.

**Eremomela pusilla* Green-backed Eremomela. Common in woodland and all other wooded habitats.

**Sylvietta brachyura* Northern Crombec. Small numbers in woodland, thickets on bovals, edge of riparian forest.

**Phylloscopus trochilus* Willow Warbler. PM. Probably arrives Sep: Greig-Smith (1977a) shows presence Oct–Nov; none seen by 9 Sep 2004 when we left. Wintering

not known. We found it common throughout, 5–15 Mar, and still passing on 3 Apr (AH).

P. collybita Common Chiffchaff. PM. One record: 16 Jan (Cruse 2006). Greig-Smith considered (1977a) his possible sightings uncertain.

**Hyliota flavigaster* Yellow-bellied Hyliota. Locally in tall woodland, mainly near the southern boundary, also near Brugbani.

Sylvia borin Garden Warbler. PM. Southward passage Oct to early Dec (Greig-Smith 1977a); no spring records.

S. communis Common Whitethroat. PM. Small numbers from early Oct (Greig-Smith 1977a) to at least 11 Jan (Sutton 1970).

Cisticolidae

**Cisticola juncidis* Zitting Cisticola. Not reported until Aug 2004, when we found a few singing in medium-short wet grassland below the motel.

**C. natalensis* Croaking Cisticola. Common in floodplain grassland, on some bovals, and in patches of water-logged wooded grassland.

**C. guinea* Dorst's Cisticola. *C. ruficeps* in GS; see Dowsett-Lemaire *et al.* (2005). Locally common in short, open woodland, either on sand (as between Brugbani and Haraba-Haraba pool) or waterlogged clay (near Ducie, between Mole and Brugbani, near Mognori, Degbere). Once in well-drained, open woodland north of Kananto. Often with *C. natalensis* in wet situations, and with *C. rufus*, *C. cantans* and *Emberiza affinis* in dry woodland. Very noisy Aug–Sep, still singing Oct (RD), not singing Mar.

**C. rufus* Rufous Cisticola. Listed with a query by GS. Common in dry woodland throughout, singing from the top of tall trees. In the dry season (when silent), favours remaining patches of unburnt grass in the largely burnt-over woodland.

**C. brachypterus* Short-winged Cisticola. In moister and more open situations than *C. rufus*: at the edge of waterlogged grassland, in floodplain with bush layer or small trees (*Ziziphus*, *Mitragyna*), moist ecotone between riparian forest and dry woodland, where common.

**C. aberrans* Rock-loving Cisticola. Listed by GS based on Harvey & Harrison (1970) from the Damongo scarp, outside the park. A few found in rocky woodland on the Konkori scarp, Mar 2005.

**C. lateralis* Whistling Cisticola. Very common throughout in rank grass, shrubs and thicket clumps in woodland, and at the edge of riparian forest. Sings from tall trees and feeds in trees, thickets and grassland. Tends to be in better-developed woodland than other cisticolas, and has larger territories.

**C. erythrops* Red-faced Cisticola. More local than other cisticolas, always near marsh and streams, in rank grass and shrubs.

**C. cantans* Singing Cisticola. Widespread in dry woodland, favouring the shrub layer. More scattered than *C. rufus*, but common; sings at all seasons.

**C. galactotes* Winding Cisticola. Confined to Mole marsh, particularly in sedges; common and noisy in the rains, not heard in Mar.

**Prinia subflava* Tawny-flanked Prinia. Very common in rank grass and shrubs in woodland and floodplain.

**Heliolais erythropterus* Red-winged Warbler. Common in rank grass and shrubs in woodland, locally in floodplain grassland and edge of riparian vegetation. Frequently counter-sings with *Prinia subflava*.

**Apalis flavida* Yellow-breasted Apalis. GS included it on the basis of a record by M. Edmunds and L. Grimes but Grimes (1987) later rejected the record. Common in riparian thickets or forest, in shrub layer or small trees (e.g. in *Morelia* and *Cola laurifolia* on the Samole below the motel), also in taller trees including *Anogeissus*. Throughout.

**Camaroptera brachyura* Grey-backed Camaroptera. Very common in riparian formations throughout, and small thickets in floodplain, edge of bovals or in woodland.

**Hypergerus atriceps* Oriole Warbler. Common in riparian forest or mainly evergreen thickets, from the Konkori scarp southwards. Feeds in the shrub layer and mid-stratum.

Muscicapidae

**Bradornis pallidus* Pallid Flycatcher. Fairly common throughout in woodland.

**Melaenornis edolioides* Northern Black Flycatcher. Common on the edge of riparian forest and floodplain (especially *Anogeissus*), in tall trees with open ground nearby.

**Ficedula hypoleuca* Pied Flycatcher. PM. Common from early Oct, wintering (Greig-Smith 1977a), to 9 Apr (Macdonald 1978a). Widespread in woodland and edge of riparian formations.

Muscicapa striata Spotted Flycatcher. PM. A few from early Oct (Greig-Smith 1977a) to 26 Mar (Wink 1976, AH).

**M. aquatica* Swamp Flycatcher. Low in riparian forest on the edge of large stretches of water, very local (edge of Dam 1, Haraba-Haraba pool, Mole river at Nyanga).

**M. caerulescens* Ashy Flycatcher. One in tall *Nauclea pobeguinii* trees at Haraba-Haraba pool (19 Aug). Not found in Mar but photographed at the same spot, 29 Jan 2008 (TTE).

**Myioparus plumbeus* Lead-coloured Flycatcher. Widespread in riparian forest and woodland, dry *Anogeissus* forest, thickets on the edge of bovals.

Platysteiridae

**Batis senegalensis* Senegal Batis. Common in woodland and on the edge of riparian forest.

**Platysteira cyanea* Common Wattle-eye. Common in riparian forest (even in thin riparian on the Samole and Brugbani streams), and in riparian woodland.

Monarchidae

**Elminia longicauda* African Blue Flycatcher. Common in riparian forest and thickets, even small thickets on the edge of pools, e.g. Old Ducie.

**Terpsiphone viridis* African Paradise Flycatcher. Resident (GS), or partial migrant with numbers augmented in the rains (Greig-Smith 1977a). In the rains, common in

riparian forest and woodland, also in *Anogeissus* forest, thickets on the edge of bovals, some thicket clumps in woodland. In Mar, quite common still, but more strictly riparian.

Timaliidae

**Turdoides plebejus* Brown Babbler. Common in woodland and at the edge of riparian woodland.

**T. reinwardtii* Blackcap Babbler. Common in riparian forest with some evergreen elements, as on the Konkori scarp, along the Mole and Lovi rivers, along some of the Samole, Haraba-Haraba pool.

Paridae

**Parus leucomelas (guineensis)* White-winged Black Tit. Common in all woodland types.

Remizidae

**Anthoscopus parvulus* Yellow Penduline Tit. Only three sightings, of pairs in woodland (Ducie, Brugbani, Jang); one feeding on the flowers of *Detarium*. GS considered it common.

Certhiidae

**Salpornis spilonotus* Spotted Creeper. A few in woodland, usually in mixed parties. One at a nest, 8 Feb (Plat 1997).

Nectariniidae

**Anthreptes longuemarei* Western Violet-backed Sunbird. Four sightings, in woodland or canopy of riparian forest (Asibey's pools). A pair feeding on *Ziziphus* flowers, Aug; a male with young, feeding on *Daniellia* flowers, Mar.

**A. platurus* Pygmy Sunbird. AM. Common visitor in the dry season (Greig-Smith 1977a), present from at least 16 Oct (RD) to 27 Mar (AH). None Aug–Sep 2004, but very common in Mar 2005.

**Nectarinia verticalis* Green-headed Sunbird. Fairly common in well developed riparian forest, from Konkori south to Mognori and Degbere. Frequently taking nectar in *Berlinia* flowers, and mistletoes.

**N. senegalensis* Scarlet-chested Sunbird. Abundant throughout, woodland, thickets and forest. One occupied nest in a tall *Daniellia*, another in an *Acacia dudgeoni* (Aug).

**N. venusta* Variable Sunbird. Rare (GS); one male in breeding dress Nov (Greig-Smith (1977b). Two in eclipse plumage, in riparian forest at Haraba-Haraba, 19–21 Aug 2004.

**N. cuprea* Coppery Sunbird. Locally common in wet, open bush and woodland, especially in floodplains (in *Ziziphus* and *Mitragyna*), riparian thickets or forest. Taking nectar of Teak *Tectona grandis* at Mognori, of *Vitex doniana*, *Berlinia grandiflora*.

**N. coccinigastra* Splendid Sunbird. Widespread in riparian forest and woodland, also tall woodland not far from rivers. Often at flowers of *Berlinia grandiflora*, and at mistletoe flowers in *Ceiba*.

**N. pulchella* Beautiful Sunbird. Common in riparian woodland or forest, and wooded floodplain (*Mitragyna*); feeding on *Vitex doniana* flowers, Mar. Most birds in (partial) eclipse plumage Aug 2004, but in breeding dress and breeding Aug–Oct (Genelly 1969, Greig-Smith 1977b).

Zosteropidae

**Zosterops senegalensis* Yellow White-eye. Common in riparian forest and woodland, thickets, *Anogeissus* forest, more local in dry woodland (not far from water).

Oriolidae

**Oriolus auratus* African Golden Oriole. Considered a dry-season visitor by Greig-Smith (1977a), but probably largely resident, as we found it equally common and vocal at both seasons. Widespread in riparian forest and woodland, edge of floodplain (feeding on figs), more local in *Anogeissus* forest and dry woodland.

Laniidae

Lanius gubernator Emin's Shrike. A male near Konkori, 12 Jan 1969 (Sutton 1970). An adult and juvenile near Mognori, 16 Aug 2006 (Hoddinott 2007, AH).

**L. senator* Woodchat Shrike. PM. Winters from Dec (Greig-Smith 1977a) to 9 Apr (Macdonald 1978a); probably longer, as present in the north of Ghana Oct–May (Sutton 1970, Grimes 1987). We saw two in open woodland, 8 and 14 Mar.

**Corvinella corvina* Yellow-billed Shrike. In groups, locally in fairly open woodland. Likes some open ground for hunting, as on the edge of bovals and bush camps. Scattered, throughout the park.

Malaconotidae

**Nilaus afer* Brubru. Widespread in woodland.

**Dryoscopus gambensis* Northern Puffback. Common in riparian forest and woodland, *Anogeissus* forest, any thickets.

Tchagra minutus Marsh Tchagra. Harvey & Harrison (1970) collected a specimen and GS had small numbers in marsh. No further reports.

**T. senegalus* Black-crowned Tchagra. Very common throughout woodland and wooded grassland (edge of floodplains).

**Laniarius aethiopicus* Tropical Boubou. Local in riparian forest with dense thickets, on the Samole river at Degbere, Kananto, near Haraba-Haraba, on the Mole north of Asibey's pools.

**L. barbarus* Yellow-crowned Gonolek. Common in riparian thicket and forest throughout. Less numerous on the Konkori scarp.

**Malaconotus sulfureopectus* Sulphur-breasted Bush Shrike. Common throughout in riparian forest and woodland, and floodplain with tall trees (especially *Anogeissus*).

**M. blanchoti* Grey-headed Bush Shrike. Frequent but widespread, in riparian forest and also tall woodland.

Prionopidae

**Prionops plumatus* White Helmet Shrike. Widespread in woodland, *Anogeissus* groves. In groups, sometimes with *Anaplectes rubriceps* and *Dicrurus adsimilis*.

Dicruridae

**Dicrurus ludwigii* Square-tailed Drongo. Confined to tall riparian forest on the Mole, from Mognori north to area of Asibey's pools; also at Kananto (on the Samole).

**D. adsimilis* Fork-tailed Drongo. Common in all woodland types.

Corvidae

Ptilostomus afer Piapiac. Apparently rare, the only certain observations being of one accompanying a Warthog *Phacochoerus aethiopicus* (ZW), and five on 27 Feb 2002 (RC). Maze (1971) reported up to 30 in Aug, and GS "small numbers" in riparian forest; however, given that neither of these observers listed *Lamprotornis caudatus*, which is typical of riparian forest, misidentification is a possibility.

**Corvus albus* Pied Crow. Irregular visitor to the buildings area; we had only one record, Aug.

Sturnidae

**Lamprotornis purpureus* Purple Glossy Starling. Widespread in woodland, Mar and Aug. Large flocks came to roost at Ducie from feeding areas outside the park, Mar. Apparently not more numerous in the dry season, as suggested by Greig-Smith (1977a).

**L. chalcurus* Bronze-tailed Glossy Starling. Rare: one pair in woodland north of Brugbani, 13 Mar 2005, next to *L. chloropterus* and *L. purpureus*. Identified by relatively large size and red-orange eye. Reports of large numbers (Harvey & Harrison 1970, Maze 1971) probably erroneous (Harvey & Harrison wrote "probable examples"), most likely of *L. purpureus*. GS was unsure of the species he saw (*L. chalcurus* or *L. chalybaeus*).

L. chalybaeus Greater Blue-eared Starling. Reported Oct–Nov (R.B. Payne in Greig-Smith 1977a). A species of dry woodland characterized by *Acacia* and Baobabs. No other reports.

**L. chloropterus* Lesser Blue-eared Starling. AM. Absent in the rains, local in woodland in Mar: near Nyanga, north of Brugbani (with other *Lamprotornis*). Small numbers Dec–Mar (Sutton 1970, Macdonald 1978b, RC, pers. obs.). Not listed by GS.

**L. caudatus* Long-tailed Glossy Starling. Not listed by GS. Known to wildlife guards for at least 20 years. Pairs and small groups in open wooded floodplains and edge of riparian forest, at both seasons. Widespread from the Mole river at Nyanga to the south. Regular below the motel.

**Cinnyricinclus leucogaster* Violet-backed Starling. AM. Breeding visitor Feb–Jul (Greig-Smith 1977a and several observers). Widespread by Mar in woodland and riparian forest, one occupied nest hole at Brugbani, 9 Mar. We saw none Aug–Sep, but Harvey & Harrison (1970) had a male, 23 Aug.

**Buphagus africanus* Yellow-billed Oxpecker. GS recorded it "frequently in moderate numbers". Now less common: one on a Warthog below the motel, Aug–Sep; one on the back of a Buffalo *Syncerus caffer* near Nyanga, 8 Mar; one over the Mole marsh, 9 Mar. Warthog (also recorded by Dutson & Branscombe 1990) and

Buffalo said to be the main hosts, more rarely Kob *Kobus kob* (ZW); JFW saw one with Roan Antelope *Hippotragus equinus*, Dec 1971.

Passeridae

**Passer griseus* Northern Grey-headed Sparrow. Commensal and common, but also in woodland and on the edge of floodplain. Greig-Smith (1977a) suggested the woodland populations may increase in the dry season.

**Petronia dentata* Bush Petronia. Partial AM, more numerous in the dry season, throughout woodland, from at least mid-Oct (RD) to Mar (pers. obs.). Uncommon Aug–Sep, with 1–2 at three localities.

Sporopipes frontalis Speckle-fronted Weaver. One record: breeding on “acacia” flats below the motel (probably *Ziziphus* or *Dichrostachys*, as there are no acacias), with many nests and at least 20 birds, 5 and 26 Oct 1975 (Greig-Smith 1977b; R.B. Payne *in litt.*), far to the south of its usual distribution. No other records in Ghana.

**Plocepasser superciliosus* Chestnut-crowned Sparrow Weaver. Common in woodland and at the edge of riparian formations, usually where there is some thick undergrowth.

Ploceidae

**Ploceus luteolus* Little Weaver. Widespread in Mole, in territorial pairs in riparian woodland, *Acacia* woodland and wooded floodplain (*Anogeissus*, *Ziziphus*, *Mitragyna*). Several nests in *Acacia dudgeoni* and *A. gourmaensis* at Jang, some occupied, next to wasps’ nests, Sep. Some birds changing into breeding dress, early Mar; a male working on a nest at Dam 1, 9 Mar.

**P. nigricollis* Black-necked Weaver. Small numbers in evergreen riparian forest from the Konkori scarp and Nyanga (Mole river) south to Mognori, and on the Samole (common at Kananto). Several nests in a loose cluster in *Quisqualis* thickets over the water at Nyanga, with several birds working on well-advanced nests, 8 Mar.

**P. heuglini* Heuglin’s Masked Weaver. Only one record, at Jang, Sep. One fresh nest and an old one in a large *Acacia sieberiana*, not occupied then.

**P. cucullatus* Village Weaver. Small numbers in riparian vegetation, feeding in forest and adjacent woodland and breeding in colonies on the edge of water, Aug–Sep.

**P. melanocephalus* Black-headed Weaver. Two pairs seen by Harvey & Harrison (1970) in the rains of 1968, one collected. We found single males chasing females and a few nests in bushes low over water at three localities, Aug 2004: Haraba-Haraba pool, Mole river at Mognori, Samole stream near Brugbani. Several unoccupied nests in low *Quisqualis* thicket over a pool of the Mole river at Nyanga, Mar 2004. No other reports in Ghana (Grimes 1987).

**Anaplectes melanotis* Red-headed Weaver. Occasional in woodland, *Anogeissus* forest and on the edge of riparian formations. Often feeds in association with *Prionops plumatus*. Male in breeding dress at Old Ducie, 6 Mar (pers. obs.), and 18 Oct (RD). Nests solitary (pers. obs.); five new nests together in a *Pterocarpus* containing an occupied nest of *Milvus migrans*, Feb 1979 (JFW).

**Quelea erythrops* Red-headed Quelea. "AM?" in GS, but not included as a migrant in Greig-Smith (1977a), and probably resident. "Abundant" in GS, but no more than small numbers locally in 2004–5, in floodplain grassland on the Samole, Mole river at Nyanga and Haraba-Haraba. Breeding Jul–Sep (Greig-Smith 1977b). We saw it at both seasons, in flocks of up to 20 in Aug (when in breeding dress) and a few dozen in Mar. Maze (1971) had flocks in Jan and Apr.

**Q. quelea* Red-billed Quelea. AM. At least one well seen, in non-breeding dress with bishops, 14 Mar 2005, on the edge of Dam 2. Close to southern limit of range, and may not occur annually. No previous reports.

**Euplectes afer* Yellow-crowned Bishop. Considered abundant by GS; conspicuous but small numbers in floodplain grasslands at Samole, Mole from Haraba-Haraba to Mognori, 2004–5. Breeding Jul–Aug (Greig-Smith 1977b) and Sep (pers. obs.); still in full dress mid-Oct (RD).

**E. hordeaceus* Black-winged Bishop. Widespread, locally common in tall grass with bushes in open woodland.

**E. franciscanus* Northern Red Bishop. Widespread in large flocks in the dry season. Breeds in floodplain grassland with *Mitragyna*, particularly common at Mognori, even in tall mint scrub, and locally on bovals, singing from tall trees on the edge.

**E. macroura* Yellow-mantled Whydah. Widespread in open woodland with extensive grass cover, in *Mitragyna* floodplain, and on some large bovals.

Estrildidae

Nesocharis capistrata Grey-headed Oliveback. Known only in riparian vegetation on the Lovi river (Harvey & Harrison 1970); also seen by GS.

**Pytilia hypogrammica* Yellow-winged Pytilia. One male in short woodland near Samole, Aug, is our only record. One previous record (GS, who treats it as AM, but no reason to suppose this is a migrant).

**P. phoenicoptera* Red-winged Pytilia. Widespread at both seasons, in woodland with small thickets from Lovi to Mognori. Resident, not AM as in GS.

**Lagonosticta rufopicta* Bar-breasted Firefinch. Widespread in riparian thickets on the Lovi, Mole and Samole.

**L. senegala* Red-billed Firefinch. Common in thickets and short woodland, especially near settlements but also edge of bovals.

**L. rara* Black-bellied Firefinch. In ranker growth than other firefinches: tall grass and rich woodland, edge of riparian forest or thickets. Local: Samole and Kananto-Degbere to Brugbani and Lovi.

**L. larvata* Black-faced Firefinch. Widespread in any woodland, throughout.

**Estrilda caerulescens* Lavender Waxbill. Locally common, with small numbers in thickets at edge of floodplain and riparian forest from Lovi south.

**E. melpoda* Orange-cheeked Waxbill. Common in rank grass, open woodland and near water.

**E. troglodytes* Black-rumped Waxbill. Several at Jang and boundary road near Jang, Sep 2004. A few below motel, 27 Mar 2005 (AH). These are the first reports.

**Uraeginthus bengalus* Red-cheeked Cordon-bleu. Common in small thickets in woodland, floodplain and riparian formations.

**Ortygospiza atricollis* African Quailfinch. First recorded 2004–5: several pairs or singles in Mole marsh, both seasons; in the Samole plain, in a boval near Brugbani, and in short woodland on the Brugbani road, Aug.

Euodice cantans African Silverbill. One record, of two small groups, 4–6 Jan 1978 (Macdonald 1978b), south of their normal range in Ghana.

**Spermestes cucullatus* Bronze Mannikin. Very common in any grassland.

Amadina fasciata Cut-throat Finch. Vagrant: a few seen once in the dry season, at a pool at Samole, early 2000s (ZW).

Viduidae

**Anomalospiza imberbis* Parasitic Weaver. One in non-breeding dress seen at close range, in company with bishops, on the edge of Dam 2, 14 Mar 2005. Stubby, deep horn-coloured bill and short tail were diagnostic. One previous record in the north of Ghana (Grimes 1987).

**Vidua chalybeata* Village Indigobird. Identified only near Samole headquarters, Aug–Sep, Mar, singing with imitations of *Lagonosticta senegala*.

**V. camerunensis* Cameroon Indigobird. Several males in breeding dress singing at edge of thickets near Kananto camp, clearly imitating calls and songs of *Lagonosticta rara*, one of the known hosts (Payne 2004) and the only possible one in Mole, Aug 2004. Tape-recorded at Lovi camp, Oct 1975, with imitations of *L. rara* (Payne 1982, then under the name *V. raricola*).

**V. larvaticola* Baka Indigobird. Males in breeding dress at Brugbani camp, boval near Steep Hill, short woodland between Samole and entrance gate (group of several males imitating song of *Lagonosticta larvata*), Aug–Sep 2004. Also collected at Lovi (Payne 2004).

**V. wilsoni* Wilson's Indigobird. Identified with certainty only on the edge of riparian forest at Mognori, Aug 2004, where a male (breeding dress) and a female were associating with *Lagonosticta rufopicta*, the known host (Payne 2004). Also collected at Lovi (Harvey & Harrison 1970, Payne 1982, 2004) and tape-recorded near Mole motel, Oct 1975 (Payne 1982).

**V. macroura* Pin-tailed Widow. Any open and relatively short grassland, of floodplain, open woodland and bovals.

**V. interjecta* Exclamatory Paradise Widow. Widespread, as is its host, *Pytilia phoenicoptera*, in woodland, floodplain and the edge of bovals near Samole, Brugbani, Haraba-Haraba, Mognori, Aug–Sep 2004. Observed and photographed Oct (RD, Payne 1985).

**V. togoensis* Togo Paradise Widow. Two males in short woodland near Samole, Aug 2004.

Fringillidae

**Serinus mozambicus* Yellow-fronted Canary. Very common in woodland, floodplain.

**S. gularis* Streaky-headed Seedeater. Common in well-developed woodland, mainly in the south of the park. Complex song, includes imitations of *Merops hirundineus* and *Parus leucomelas*. Singing a lot in the rains, not in Mar.

Emberizidae

Emberiza hortulana Ortolan Bunting. PM. An adult male filmed near the motel, 23 Mar 2006 (Lister 2007). New for Ghana.

**E. tahapisi* Cinnamon-breasted Rock Bunting. AM. Dry season visitor, extreme dates 1 Oct (Genelley 1969) to Apr (Greig-Smith 1977a). Widespread from the Konkori scarp southwards, along roads and bare ground near motel, Mar 2005.

**E. affinis* Brown-rumped Bunting. Locally common in woodland, especially open, short woodland, from Ducie southwards.

**E. cabanisi* Cabanis's Bunting. Local in tall woodland especially in the south (Degbere-Kananto, Mognori, Brugbani) but also near Konkori.

Breeding records

Greig-Smith (1977b) summarized breeding records up to 1975 but most (*e.g.* "males in breeding dress") cannot be back-dated to month of egg-laying. The data available suggest a concentration of breeding in Jun–Aug for many species. Some species start Feb–Mar, but the start of breeding in Mole generally remains little documented due to scarcity of visits Apr–Jun.

Butorides striata. Pair replacing each other on nest (brooding) early Sep (= laying Aug).

Ephippiorhynchus senegalensis. Laying probably Oct (details above).

Leptoptilos crumeniferus. Laying probably Nov (details above). Clutches Oct–Jan (*per* JFW).

Streptopelia vinacea. Mating 21 Aug.

S. semitorquata. Nest-building 19 Aug.

Turtur abyssinicus. Mating 28 Aug.

Apus affinis. At least three nests with nestlings Aug (= laying Jun–Jul).

Merops bulocki. Many occupied nests Mar (= laying mainly late Jan to Feb). A large proportion of birds mist-netted by Greig-Smith (1977b) in Jul–Aug were moulting.

Hirundo smithii. A pair feeding three juveniles at the motel 16–18 Oct (RD) (= laying probably Aug).

Campephaga phoenicea. Dependent fledgling 29 Aug (= laying late Jun to Jul).

Pycnonotus barbatus. Dependent fledgling 29 Aug (= laying late Jun to Jul). Three of four adults were half-way through primary moult late Aug.

Turdus pelios. Dependent fledgling 26 Aug (= laying late Jun to Jul). A female had a brood-patch at stage of brooding nestlings, 29 Aug (= laying Aug).

Cossypha albicapilla. A female had a brood-patch at stage of brooding nestlings, 30 Aug (= laying Aug). A male in primary moult, same date.

C. niveicapilla. Two males in early primary moult 30 Aug.

- Eremomela pusilla*. Large dependent fledgling 12 Aug (= laying Jun).
- Cisticola rufus*. Small fledglings 13 Aug (= laying late Jun to Jul). Feeding nestlings 25 Aug (= laying Jul to early Aug).
- C. brachypterus*. Nest-building 7 Sep.
- C. lateralis*. Independent immatures, with adults, 22 Aug to 5 Sep, suggesting breeding was over.
- C. cantans*. Independent immatures, with adults, 27 Aug to 5 Sep, suggesting breeding was over.
- Prinia subflava*. Feeding nestlings 4 Sep (= laying Aug).
- Bradornis pallidus*. Independent immature with adult, 24 Aug.
- Melaenornis edolioides*. A family with recently fledged young, 16 Aug 1974 (= laying Jul) (JFW).
- Batis senegalensis*. Nearly independent juvenile 16 Aug; dependent fledgling 21 Aug (both = laying Jun).
- Platysteira cyanea*. Female begging from male (*i.e.* incubating) 25–26 Aug (= laying Aug).
- Elminia longicauda*. Dependent, almost full-grown fledging, 18 Aug; another 19–21 Aug (both = laying Jun); fledgling being fed early May (= laying Mar) (TTE).
- Terpsiphone viridis*. Dependent fledgling 30 Aug (= laying late Jun to Jul).
- Anthreptes longuemarei*. Dependent fledgling fed by male 14 Mar (= laying late Jan to early Feb).
- Nectarinia senegalensis*. Female nest-building in tall *Daniellia*, 17 Aug, had laid before end Aug. Another feeding a large juvenile 19 Aug (= laying Jun). One feeding small fledgling, 29 Aug (= laying Jul). One feeding nestlings in *Acacia dudgeoni*, 6 Sep (= laying Aug).
- N. cuprea*. Female feeding at nest, 9 Mar (= laying Feb).
- Zosterops senegalensis*. Pair with full-grown juvenile, partly dependent, 5 Sep (= laying Jun–Jul).
- Dryoscopus gambensis*. Female nest-building 15 Aug. A male in early primary moult, 22 Aug.
- Cinnyricinclus leucogaster*. Pair attending nestlings, 9 Mar (= laying Feb).
- Ploceus luteolus*. Female brooding, 5 Sep (= laying probably Aug). Male nest-building Mar.
- P. nigricollis*. Pairs finishing nest, 8 Mar.
- P. melanocephalus*. Males displaying Aug, one mating 21 Aug.
- Anaplectes melanotis*. Male nest-building 18 Oct (RD).
- Euplectes afer*. Female nest-building 1 Sep.
- Estrilda melpoda*. Nest-building 26 Aug.
- Serinus mozambicus*. Dependent fledging 15 Aug (= laying Jun).

Discussion

Species rejected or in need of confirmation

Ten species reported in Mole before 1976, not listed by Greig-Smith (1976) but apparently accepted by Grimes (1987). Of these, at least the following nine appear unlikely.

Neophron percnopterus Egyptian Vulture. An adult along the motel scarp, 9 Aug 1968 (Harvey & Harrison 1970), included by Snow (1978) and Grimes (1987), should not be accepted as the only record for Ghana in the absence of supporting information. Confusion with *Gypohierax angolensis* is possible.

Gyps rueppellii Rüppell's Griffon Vulture. Accepted by Grimes (1987) based on an "uncertain" sighting of one in Mole, 11 Jan 1969 (Sutton 1970). No other acceptable records in Ghana (Dowsett *et al.* in press).

The following five species reported by Harvey & Harrison (1970) are all forest zone species and likely misidentified: Black Goshawk *Accipiter melanoleucus*, Square-tailed Saw-wing *Psalidoprocne nitens*, Simple Leaflove *Chlorocichla simplex*, Leaflove *Pyrrhurus scandens* and Blue-throated Brown Sunbird *Nectarinia cyanolaema*. *N. cyanolaema* from "riverine forest at Lovi" could have been the closely-related *N. verticalis*, not listed by the authors but common in riparian forest, and *Psalidoprocne nitens*, seen next to *P. obscura*, could have been a juvenile of the latter.

Eremomela icteropygialis Yellow-bellied Eremomela. Reported by Harvey & Harrison (1970) and Taylor & Macdonald 1978) is, in W Africa, resident in *Acacia* woodland in the Sahel and not known to undergo irruptions: we believe that confusion with *E. pusilla* cannot be ruled out. There are no other records for Ghana.

Lagonosticta rubricata Blue-billed Firefinch. Harvey & Harrison thought they saw one at Lovi, but the species was not found by Payne (2004), nor by anyone else, and its presence requires confirmation.

Ploceus velatus (vitellinus) African Masked Weaver is the tenth species not in Greig-Smith (1976) but in Grimes (1987), based on Harvey & Harrison (1970). We saw what appeared to be a female of this species near the clinic at Mole, 7 Sep 2004. These records require confirmation, but Sutton (1970) reported it nesting at Damongo, late Mar.

Species in Greig-Smith (1976) which should be rejected or considered unconfirmed

Alopochen aegyptiaca Egyptian Goose. Two reported Aug 1968 (Genelly 1969), but this would be only the second Ghana record and the observer made no mention of the common *Plectropterus gambensis*.

Accipiter tachiro African Goshawk. Doubtful records of this rain forest species by Genelly (1969), whose description of the voice is inaccurate. Harvey & Harrison (1970) reported "what was probably an immature". One sight record in Greig-Smith (1976) should be considered uncertain. Noisy, with unmistakable display calls never heard by recent observers in Mole.

Falco peregrinus Peregrine Falcon. The only report is in Greig-Smith (1976); confirmation is desirable: *F. biarmicus*, not mentioned, is more likely.

Turnix hottentottus Black-rumped Buttonquail. A rare species of moist grassland, essentially a rains migrant, but Maze (1971) claimed to have seen five in Apr (end of dry season). This (one of two reports for Ghana) cannot be accepted in the absence of supporting details.

Pluvialis squatarola Grey Plover. One report of this mainly coastal species in Apr (Maze 1971) should not be accepted in the absence of identification details.

Tringa totanus Redshank. One reported near Damongo, 23 Aug (Harvey & Harrison 1970), repeated as "Sept?" in Greig-Smith (1977a), is from outside the park.

Cuculus canorus Eurasian Grey Cuckoo. Greig-Smith (1976) listed this as PM/AM?, early Dec (Greig-Smith 1977a), but *C. gularis* certainly occurs, and silent birds of either are difficult to identify. Not included by Grimes (1987).

Colius striatus Speckled Mousebird. Recorded by Greig-Smith (1976) as "rare: seen regularly in small numbers" without further details; apparently interpreted by Grimes (1987) as "c. 5 or less" and attributed to race *nigricollis*, although no records exist from anywhere in W Africa west of Nigeria (H. Schifter *in litt.*). Wilson (1993) wrote that he saw it eight times, but his report includes a number of errors. Unknown to wildlife guards, including two who have been working in Mole for some 25 years. J.F. Walsh (*in litt.*) never saw it in Ghana, 1970–6 and 1979, including several days in Mole. Should be deleted from the country's avifauna until proof is obtained (Dowsett *et al.* in press).

Caprimulgus inornatus Plain Nightjar. Listed as an intra-African migrant by Greig-Smith (1976) on the basis of "nightjars....probably of this species" (Harvey & Harrison 1970), and records by M. Edmunds and L. Grimes. A male reported by Dutson & Branscombe (1990), is best considered unconfirmed (G. Dutson *in litt.*). Confusion with *C. pectoralis* possible.

Merops orientalis Little Green Bee-eater. Based on two reported by Maze (1971) in Apr, but this would be the only record as far south as Ghana, and Maze did not report the fairly common *M. pusillus*. Rejected by Grimes (1987).

M. malimbicus Rosy Bee-eater. One reported near Lovi, 7 Aug (Harvey & Harrison 1970) far from its normal non-breeding range.

Galerida cristata Crested Lark. Reported from bovals, accepted by Grimes (1987). This would be the only record in Ghana of a species normally found in extensive sandy plains in the Sahel. Probably confused with *G. modesta*, the characteristic lark of bovals in W Africa.

Acrocephalus rufescens Greater Swamp Warbler. A pair "almost certainly of this species" seen in "reeds" below the motel (Harvey & Harrison 1970). There was no suitable habitat then as today, and this record must be considered unproven.

Lanius collaris Fiscal Shrike. Wet season sightings claimed by Genelly (1969) and Harvey & Harrison (1970), but details such as birds "searching for insects" and in "thick cover" suggest *Laniarius aethiopicus* (which neither report listed).

Later records that should be rejected or require confirmation

Ceyx lecontei African Dwarf Kingfisher. A record of this rain forest species in Cruse (2002) was later withdrawn (Cruse 2003).

Erythropygia galactotes Rufous Bush Chat. PM. One on 10 Feb 2003 (Cruse 2003) would have been the first report this far south (and in Ghana), but it was not well seen and the observer considers it unproven (R. Cruse *in litt.*).

Hippolais icterina Icterine Warbler. One “almost certainly this species”, 4 Apr 1976 (Taylor & Macdonald 1978), was accepted by Grimes (1987), but there is no supporting description and difficult to separate from *H. polyglotta*. Few authentic records from W Africa.

Muscicapa gambagae Gambaga Flycatcher. One report, 7–8 Apr (Taylor & Macdonald 1978), with a brief description that does not exclude the possibility of *M. striata*.

M. ussheri Ussher’s Flycatcher. A record of this forest species (Plat 1997) is surely erroneous.

Estrilda astrild Common Waxbill. Listed by Plat (1997) but more likely *E. troglodytes*.

Composition of the avifauna

With some 350 species now reported from Mole, the avifauna can be considered as reasonably well known. However, the near-lack of data for May–June and the short duration of most visits mean that the status of many migrants and the duration of their stay remain incompletely documented.

Numbers of waterbirds seem low, but large sections of the park are inaccessible in the rainy season due to flooding and poor road infrastructure, so they may be underestimated.

Although the list of Palaearctic migrants is quite long, most appear uncommon and have been seen mainly on passage. The few species that seem to winter regularly include *Hippolais polyglotta*, *Phylloscopus trochilus*, *Ficedula hypoleuca* and *Lanius senator*. *Acrocephalus schoenobaenus* may winter at permanent vegetated pools (e.g. near Mognori). Numbers of three other wintering species, *Anthus trivialis*, *Saxicola rubetra* and *Muscicapa striata*, seem to have decreased in recent decades (as in their European range, BirdLife International 2004).

The avifauna is typically Sudanian, and 36 of the 37 species considered endemic to the Sudanian (Sudan-Guinea) biome that occur generally in Ghana (Fishpool & Evans 2001) are represented in Mole NP, the exception being *Muscicapa gambagae*, which requires confirmation. When the taxonomic limits of indigobirds become better known (Payne 2004), more *Vidua* species may be added to this biome list, especially *V. wilsoni* and *V. larvaticola*. Most of these Sudanian species are to be found in the two most characteristic and extensive vegetation types in Mole: woodland and riparian forest/thicket. One falcon (*Falco alopex*) is confined to rocky outcrops at Konkori and one lark (*Galerida modesta*) to bovals.

The presence of Guineo-Congolian forest zone species is negligible. *Tauraco persa* is a wanderer from the forest-savanna transition zone to the south. The discovery of *Indicator willcocksi* singing in riparian forest on the Konkori scarp may seem surprising, but this species penetrates locally into the forest galleries of the Sudanian region: Chappuis (2000) tape-recorded it in the Sudanian region of S Chad, at Moundou (8°35'N, 16°1'E), and we heard and saw it further north in Ghana, on the Kulpawn river (Gbele Wildlife Reserve, at 10°24'N, 2°4'W and 10°34'N, 2°13'W, Mar 2005). As already discussed in Dowsett-Lemaire & Dowsett (2007), *Psolidoprocne obscura* should not be considered as Guineo-Congolian (*pace* Fishpool & Evans 2001), as it breeds in the Sudanian region, and may occur in the Guineo-Congolian region mainly as a non-breeding migrant.

Changes to the avifauna over 30 years

The surroundings of the motel, including Mole marsh, have always been much visited over the years, and we can assume that some species changes observed in this area are real. In particular *Centropus grillii* and *Tchagra minutus* have not been recorded since the 1980s and 1970s respectively, and this can be explained by habitat changes. As poaching has been increasing over the years, large mammals were forced to concentrate in the better-protected area in the vicinity of the motel and park headquarters. Over-grazing was noticeable in the rains of 2004, both in the marsh and surrounding woodland, up to only 1 km north of the motel. As a result the height of the marsh vegetation has decreased, as related to us by the wildlife guards, and Mole marsh today no longer seems suitable for these two birds. The recent appearance of *Cisticola juncidis* and *Ortygospiza atricollis* in Mole marsh can also be attributed to the presence of shorter grass. The latter, however, was also found in some bovals and may have been overlooked in the past.

More than 50 species have been added since Greig-Smith (1976): several are rare or uncommon migrants, or local residents of rocky outcrops (a habitat not visited by Greig-Smith). A few of the latter, mentioned by Sutton (1970), had been overlooked. Others belong to groups that evidently posed identification problems at the time (*Lamprotornis* starlings, *Vidua* indigobirds). However, species such as *Podica senegalensis*, *Pachycoccyx audeberti*, *Cuculus solitarius*, *C. clamosus*, *Ceuthmochares aereus*, *Scotopelia peli*, *Caprimulgus pectoralis*, *Apaloderma narina*, *Muscicapa caerulescens* were not recorded until 1990 (*Podica*), 1996 (*P. audeberti*) or 2003–4 (albeit some of them were already known to wildlife guards for longer). They all inhabit the riparian forests of the southeast, and it is possible that they were overlooked in the 1970s through their discreet behaviour, or their voice being unknown to the observers. It seems odd that birds with distinctive calls, like *Cuculus solitarius* and *Apaloderma narina*, could have remained unnoticed for long, but this question cannot be settled. In any case, with the exception of *Podica senegalensis*, these “recent” records represent extensions of known range towards the north (Grimes 1987). The presence of a few *Tockus erythrorhynchus*, first reported in 1988, might

suggest a slight drying of conditions in the south of the park, or merely result from a small increase of the population in Ghana as a whole: the species is particularly common in the *Acacia* woodlands of Bui NP to the southwest (pers. obs.), and could have spread from there. Finally, the discovery of *Apus horus* in 2004 extends the range considerably to the southwest from S Niger (Dowsett *et al.* in press), but this species can be overlooked or confused with other white-rumped swifts.

Two species from the Sahel, *Streptopelia roseogrisea* and *Sporopipes frontalis*, were recorded in 1976 and 1975 respectively, the latter even breeding below the motel. These events were not apparently repeated, and they may have been related to drought years in the Sahel.

To conclude, from all the evidence put together, there is no indication that the region of Mole has become drier in the last three decades. There remains the mystery of the sudden and geographically limited appearance of *Colius striatus* in the 1970s, followed by its disappearance. It may even be wondered if it was correctly identified in the first place, as several people who visited northern Ghana in the late 1960s or 1970s (including L.G. Grimes, M.A. Macdonald and J.F. Walsh) never saw it, in Mole or elsewhere.

Acknowledgments

We thank the then Executive Director of the Wildlife Division, Forestry Commission (Y. Ofori-Frimpong) and the Regional Director of IUCN (I. Thiaw) for inviting us to undertake surveys. Wildlife Division staff at Accra (especially Mike Adu-Nsiah and Kodjo Menka) and Mole (Park Manager Charles Haizel and colleagues) provided much logistical support. The IUCN/WDSP Team Leader in Ghana, Peter Howard, was an enthusiastic supervisor, and his colleagues at Mole (Charles Mackie and Chris Fell) provided much practical help. In addition to the wildlife guards who were in the field with us, we warmly thank Z. Wareh for his collaboration. We are also grateful to the many colleagues who commented on partial drafts and sent their unpublished observations: Richard Cruse, Ron Demey, Andrew Hester, David Hoddinott, Bob Payne, Adam Riley, Tony Traub-Evans and Frank Walsh.

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Distribution, conservation et réponse à la provocation acoustique de la Chouette-pêcheuse rousse *Scotopelia ussheri* en zone forestière côtière de Côte d'Ivoire

par Dibié Bernard Ahon¹ & Guy Rondeau²

¹Université de Cocody, U.F.R. Biosciences, 22 BP 582 Abidjan 22, Côte d'Ivoire
<bahon2002@yahoo.fr>

²Afrique Nature International, 01 BP 4257, Abidjan 01, Côte d'Ivoire
<g.rondeau@afnature.org>

Reçu 27 août 2007; revu 16 avril 2008.

Résumé

La Chouette-pêcheuse rousse *Scotopelia ussheri*, espèce menacée et endémique aux forêts de Haute Guinée, a été suivie dans quatre aires protégées de Côte d'Ivoire (Forêts Classées de Monogaga et de Dassioko, Parcs Nationaux d'Azagny et du Banco) de décembre 2004 à novembre 2006, afin de déterminer sa distribution et son statut de conservation, et d'étudier sa sensibilité à la provocation acoustique. La méthode de suivi le long des transects à partir des stations d'écoute et la technique de repasse ont été réalisées dans différents habitats aux différentes saisons. Une enquête à partir de la photographie et de la vocalisation de l'espèce, présentées aux chasseurs professionnels, pêcheurs et paysans des sites d'étude, a complété l'étude. Sur les 80 stations d'écoute, l'espèce n'a été détectée que sur une seule station, dans une zone de forêt marécageuse à dominance de *Raphia hookeri*, le long d'un cours d'eau dans le PN d'Azagny. C'est aussi seulement dans ce parc qu'une proportion de la population interrogée a pu identifier les photographies (8 %) et la vocalisation (12 %). Les plus grandes réponses au repasse ont été obtenues en petite saison des pluies et en phase de pleine lune.

Summary

Distribution, conservation status and sensitivity to playback of the Rufous Fishing Owl *Scotopelia ussheri* in the coastal forest zone of Ivory Coast. The Rufous Fishing-Owl *Scotopelia ussheri*, an endangered species endemic to the Upper Guinea Forest, was surveyed in four protected areas of the Ivory Coast (Monogaga and Dassioko Classified Forests, Azagny and Banco National Parks) from December 2004 to November 2006, with the aim of determining its distribution and conservation status, and of studying its response to play-back. Survey was carried out on transects, with playback

stations in different habitats and seasons. A questionnaire survey of professional hunters, fishermen and peasants, using photographs and recording of the call, was carried out at the study sites. Of the 80 playback stations, the Rufous Fishing-Owl was detected in only one, in a swampy forest area dominated by *Raphia hookeri*, along a watercourse in Azagny National Park. Azagny was also the only site where a proportion of the population questioned could identify the photographs (8 %) or vocalisation (12 %). The best response to playback was obtained in the small rainy season at full moon.

Introduction

Dans l'écosystème forestier de Haute Guinée, la Chouette-pêcheuse rousse *Scotopelia ussheri* est l'une des espèces animales phares et importantes de l'avifaune de la forêt dense humide, de distribution restreinte et rare (Mackworth-Praed & Grant 1970, Atkinson *et al.* 1994, Fishpool 1994, Gatter 1997, Kemp & Kemp 1998, Stattersfield *et al.* 1998, Hoyo *et al.* 1999, Duncan 2003, BirdLife International 2004). Endémique à l'Afrique de l'Ouest, c'est une espèce résidente des zones forestières humides en bordure des cours d'eau (Mackworth-Praed & Grant 1970, Fry *et al.* 1988, Borrow & Demey 2001). D'après König *et al.* (1999) et BirdLife International (2004), il semble que cette chouette peut survivre dans les forêts secondaires, le long des petits cours d'eau. Depuis 1994, elle est classée dans la catégorie En Danger (BirdLife International 2004). Très peu étudiée, elle reste mal connue (Duncan 2003).

De décembre 2004 à novembre 2006, nous avons conduit une étude de suivi de la Chouette-pêcheuse rousse dans quatre aires protégées de la zone forestière côtière de Côte d'Ivoire, afin de déterminer et tenter d'expliquer sa distribution et son statut de conservation et de proposer une méthodologie de suivi appropriée à cette espèce.

Sites d'étude

Les quatre sites d'étude sont localisés dans la zone de forêt dense humide sempervirente, au sud de la Côte d'Ivoire, dans le Grand Domaine Guinéen (Guillaumet & Adjanohoun 1971). Selon H. Rainey (comm. pers.), la zone côtière devrait être la priorité pour le suivi de la Chouette-pêcheuse rousse en Côte d'Ivoire. Aussi, les critères tels que l'état de la forêt (primaire, dégradée ou secondaire), la superficie (les blocs de forêt disposent d'une superficie plus de 3000 ha), la répartition des sites tout au long de la zone forestière côtière ont été pris en compte pour le choix de ces aires protégées.

La Forêt Classée de Monogaga (FCM, 4°48'N, 6°26'W) compte une superficie de 39 828 ha, et pluviométrie moyenne annuelle de 1178 mm. La végétation appartient au type fondamental à *Eremospatha macrocarpa* et *Dyospiros mannii* (Aké-Assi 1997). Le relief est assez ondulé avec des altitudes de 24–131 m. Deux rivières

permanentes constituent les limites naturelles de la forêt: la Nonoua au nord et la Brimay à l'ouest. La faune est typique des forêts du bloc guinéen (SODEFOR 2001).

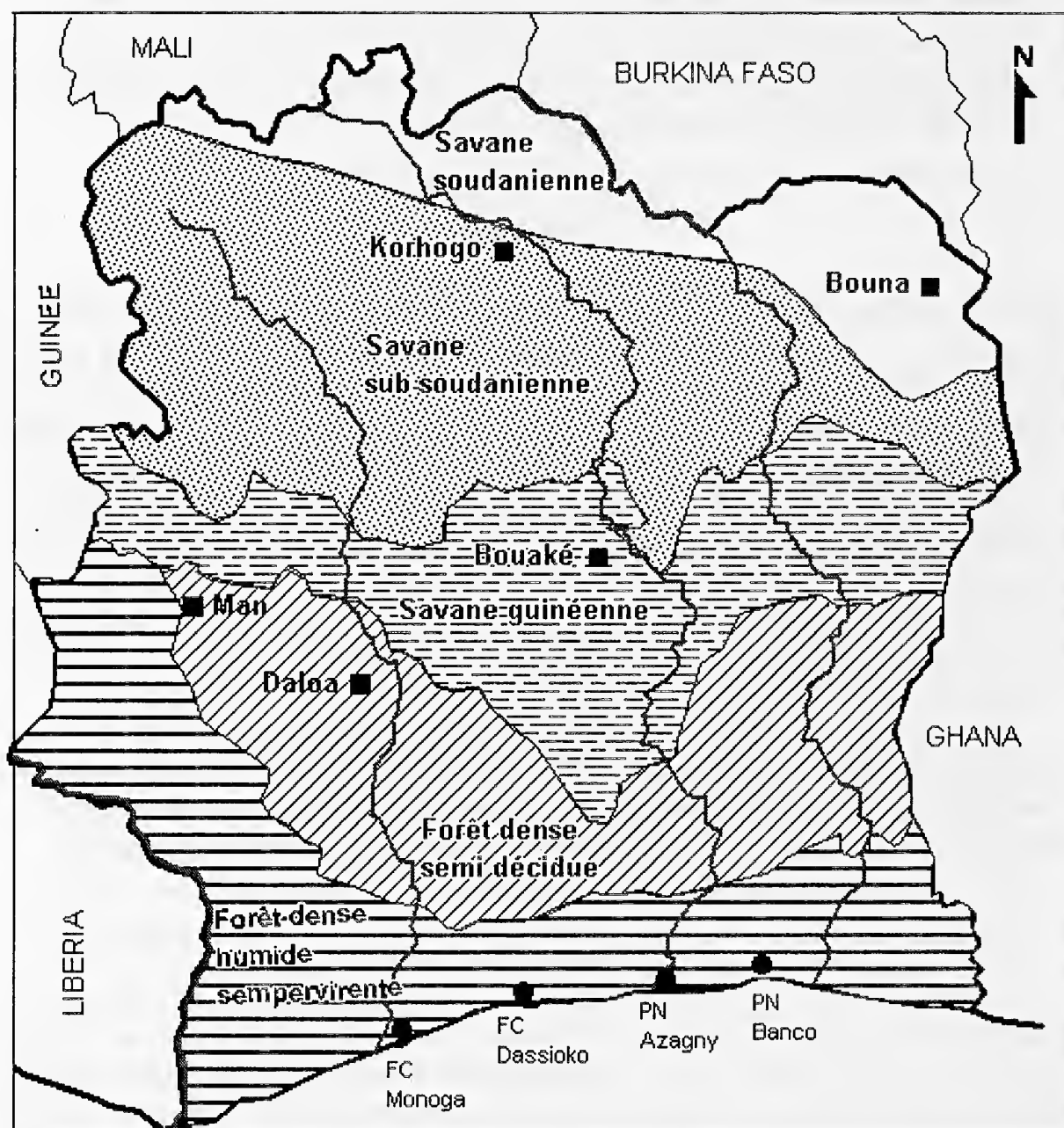


Figure 1: Localisation des sites d'étude sur la carte de la végétation de la Côte d'Ivoire (Guillaumet & Adjahoun 1971).

La Forêt Classée de Dassioko (FCD, 5°3'N, 5°52'W) a une superficie de 12 540 ha et pluviométrie moyenne annuelle de 1400 mm. Sa végétation est de type *Eremospatha macrocarpa* et *Diospyros mannii* (Aké-Assi 1997). Le relief est accidenté avec des altitudes de 10–80 m. Le réseau hydrographique est dominé par

deux fleuves côtiers: le *Dagbé* et le *Kloukoleu*. Sa faune de grands mammifères est typique des forêts du bloc guinéen. Elle est encore relativement intacte et toutes les espèces sont probablement encore présentes (SODEFOR 2002).

Le PN d'Azagny (PNA, 5°10'N, 4°50'W), localisé dans la Sous-Préfecture de Grand-Lahou, a une superficie de 19 400 ha (Coulibaly 1992, OIPR 2006a). Zone humide d'importance internationale (site Ramsar) et Zone Importante pour la Conservation des Oiseaux, le PNA constitue une des Zones d'Endémisme d'Oiseaux de la Forêt de la Haute Guinée. La pluviométrie moyenne annuelle se situe entre 1500 et 2000 mm. Sa végétation est constituée par les formations forestières (littorale et terre ferme), les forêts marécageuses, les fourrés littoraux, les marécages, les savanes lagunaires et la mangrove. Le PNA a un relief peu accentué, formé de plateaux dont l'altitude est comprise entre 40 et 100 m. Le réseau hydrographique est représenté par le fleuve Bandama, la lagune Ebrié et le Canal d'Azagny.

Le Parc National du Banco (PNB, 5°23'N, 4°3'W) est un cas exceptionnel de forêt protégée situé en plein cœur du district d'Abidjan disposant d'une superficie de 3474 ha (OIPR 2006b). La pluviométrie moyenne annuelle est de 2000 mm. La forêt est l'une des dernières reliques de forêt psammohygrophile. Les espèces dominantes ou communes incluent *Turraeanthus africanus*, *Lophira alata*, *Parkia bicolor*, *Piptadeniastrum africanum* et *Heisteria parviflora*. Son relief est représenté par des pentes très marquées. La rivière Banco constitue l'essentiel de son réseau hydrographique. Sa faune originelle d'une grande diversité a quasiment disparu sous l'effet du braconnage.

Le climat de la région est de type subéquatorial (Eldin 1971) à quatre saisons: deux saisons sèches (la grande, de décembre à mars et la petite, d'août à septembre) et deux saisons des pluies (la grande, d'avril à juillet et la petite, d'octobre à novembre). L'harmattan n'apparaît que durant quelques jours, en fin et/ou en début janvier.

Méthodes

L'emplacement des transects utilisés dans cette étude a été fait sur la base du type d'habitat, avec quatre transects de 4 km chacun réalisés dans chacun des quatre sites d'étude. Pour chaque site, trois des transects sont linéaires et un en forme de L. Deux des transects linéaires ont été localisés dans une zone de forêt en bon état de conservation (à l'intérieur de l'aire protégée) et l'autre dans une zone anthropisée (à l'intérieur ou en dehors de l'aire protégée). Le transect en forme de L s'étend sur 2 km le long d'un cours d'eau, et sur 2 km perpendiculaires au même cours d'eau. Ce transect a été choisi en vue de vérifier la dépendance ou non de la Chouette-pêcheuse rousse vis à vis du cours d'eau. Aucun des trois transects linéaires n'est placé en bordure du cours d'eau. Sur chacun des transects, cinq stations d'écoute distantes de 1 km les unes des autres, ont été marquées (soit 80 stations au total, 20 stations par site).

Le suivi de la Chouette-pêcheuse rousse s'est fait en deux phases. La première a consisté à déterminer la présence ou l'absence de l'espèce dans les quatre sites. A

chaque station d'écoute, nous avons effectué 20 min. de repasse de la vocalisation de l'espèce et 10 min. d'attente pour écouter d'éventuelles réponses. Le temps requis pour effectuer le suivi (n'incluant pas le déplacement pour se rendre au parcours et en revenir) a été de 4 h sur chaque transect. Les observations ont généralement débuté à 19h00 (0.5 h après la tombée de la nuit) et ont pris fin à 23h00. Les transects ont été parcourus à pieds. Pour chaque station d'écoute, avant de commencer la repasse de la vocalisation, il a été observé 1 min. d'écoute des hiboux qui chantaient spontanément. Ce laps de temps a permis également de mettre en place le dispositif de repasse, qui était composé d'un lecteur portatif de disques compacts relié à une paire de baffles, et le disque de Chappuis (2000). Le volume de l'appareil a été placé à la plus haute puissance possible sans que cela produise de distorsions, et avec les contrôles des notes hautes et basses à la position normal. Le son était entendu jusqu'à 300–500 m en fonction de l'état du terrain. Les baffles ont été orientés dans toutes les directions afin de maximiser la zone de couverture. Le même protocole a été utilisé dans chacun des sites, à toutes les stations et cela à quatre reprises dans l'année (Grande Saison Sèche, Grande Saison des Pluies, Petite Saison Sèche et Petite Saison des Pluies). Au total, 64 sorties nocturnes ont été effectuées sur l'ensemble des sites au cours de l'année 2005 (soit une nuit d'observation par transect et par saison);

La seconde phase a été consacrée à l'étude de la réponse de cette espèce au repasse de la vocalisation en fonction des saisons, de l'état de la lune (présence ou absence) et des heures d'observation. Cette phase a été menée au PN d'Azagny sur le seul transect (en L) et à la seule station où trois individus ont été recensés au cours de la première phase de l'étude. Ainsi, les chouettes de ce secteur ont été suivies pendant les quatre saisons. A chaque saison, deux missions d'observation ont été effectuées selon les deux principales phases lunaires (une en pleine lune et l'autre en absence de lune) qui permettent de déterminer l'effet réel de la lune sur la réponse vocale de la Chouette-pêcheuse rousse au repasse. Lorsque les conditions météorologiques (vents, couches nuageuses, précipitations) ont été détériorées de manière significative, nous avons arrêté le suivi pour le reprendre le lendemain sur le même transect. Pour chaque mission, trois sorties nocturnes ont été réalisées, soit 24 nuits d'observation pour cette phase qui s'est déroulée entre octobre 2005 et novembre 2006. En situation optimale, les observations nocturnes ont débuté à 19h00 et se sont terminées à 6h00. Toutes les heures, pendant 10 min., il a été procédé à la repasse de la vocalisation (soit 12 repasses pour chaque nuit d'observation), suivi de 50 min. d'attente pour d'éventuelles réponses vocales. Pour chaque tranche d'observation, il a été enregistré la présence (1) ou l'absence (0) de réponse.

Un questionnaire (avec pour support la photographie et la vocalisation de la Chouette-pêcheuse rousse) a été élaboré afin de mener une enquête sur la reconnaissance de l'espèce, sa distribution passée et présente, son habitat, ses diverses utilisations (nourriture, médecine traditionnelle, maraboutage) et les perceptions des populations sur l'espèce. Les populations riveraines ciblées pour cette enquête sont pour la plupart des braconniers, des pêcheurs, des paysans et des guérisseurs traditionnels. Ce volet

s'est déroulé tout au long de la période d'étude de décembre 2004 à novembre 2006.

Les données de l'enquête ont été exprimées en pourcentage de personnes interrogées aussi bien par site que par l'ensemble des quatre sites. Pour les données sur la réponse au repasse, la moyenne des scores attribuées à chaque tranche d'une heure a été calculée. L'analyse statistique de ces moyennes a été réalisée grâce au logiciel Xlstat-Pro 7.1. A été effectué une analyse de variance (ANOVA) et les comparaisons des moyennes ont été faites à l'aide du test de Newman-Keuls. Le seuil de probabilité choisi est $P < 0,05$.

Résultats

Sur les 80 stations d'écoute que compte l'ensemble de nos sites, la Chouette-pêcheuse rousse n'a été recensée que sur une seule station ($5^{\circ}14'N$, $4^{\circ}51'W$), dans le PN d'Azagny. Sur cette station, nous avons détecté trois individus à partir de leur vocalisation. Cette station est localisée sur le transect en L, sur la portion qui longe un cours d'eau de 1–2 m de largeur, isolant une petite île. Ce cours d'eau est chargé de substances organiques en décomposition et se trouve dans une zone de forêt marécageuse à dominance de *Raphia hookeri*. Ce marécage est inondé en permanence et est formé par un substrat vaseux. A ce même endroit, un juvénile de Chouette-pêcheuse rousse a été vu en petite saison sèche, dans la matinée du 25 oct 2005, sous un ciel couvert. Il était perché sur une palme de *Raphia* à c. 6 m au-dessus du cours d'eau. Cet individu est certainement l'un des trois détectés à partir de leur vocalisation.

Au total, 50 personnes de la population riveraine ont été interrogées sur l'ensemble des quatre sites (18 personnes dans la FCM, 10 dans la FCD, 15 dans le PNA et 7 dans le PNB). Seul le site d'Azagny renferme des personnes qui reconnaissent l'espèce par sa photographie (8 % des personnes interrogées) et par sa vocalisation (12 % des personnes interrogées). Seul 12 % de cet effectif reconnaît l'existence passée et actuelle de l'habitat et de l'espèce. Par ailleurs, il ressort que la population ciblée n'avait pas de perception particulière sur la Chouette-pêcheuse rousse, mais en possédait sur tous les hiboux et chouettes en général. La grande majorité de cette population a affirmé que les hiboux sont des symboles de la sorcellerie. Ainsi, les perceptions de mauvais augure, indifférence et bon augure de cette population sur les rapaces nocturnes sont respectivement de 90 %, 6 % et 4 %. Il a été noté que les hiboux et par conséquent la Chouette-pêcheuse rousse ne sont consommés seulement que par 4 % de la population interrogée, et que 4 % de la population totale reconnaît son utilité pour le soin de certaines maladies chez les enfants. Aucun individu n'a affirmé l'utilité de cette espèce dans le maraboutage.

L'étude de la sensibilité de la Chouette-pêcheuse rousse à la provocation acoustique en fonction de la saison, de la phase lunaire (pleine ou absence) et des heures d'observation, a mis en évidence des valeurs significativement différentes en fonction des saisons, de la phase lunaire et des heures du repasse. L'association entre

les variables saison et réponse est hautement significative (ddl = 3, $F = 6,606$, $P < 0,001$) ainsi que l'association entre heure et réponse (ddl = 12, $F = 55,818$, $P < 0,001$). De même, l'association entre les variables lune et réponse (ddl = 2, $F = 11,636$, $P < 0,05$) est significative. Au niveau de l'influence de l'interaction de ces trois variables (saison, lune, heure), seule l'interaction saison–lune (ddl = 3, $F = 4,727$, $P < 0,05$) a un effet significatif sur la réponse au repasse.

Au niveau de l'effet saison, la réponse en Petite Saison Pluvieuse est significativement (test de Newman-Keuls, $P < 0,05$) plus élevée (0,625) que celle de chacune des trois autres saisons (Grande Saison des Pluies 0,500, Petite Saison Sèche 0,472, Grande Saison Sèche 0,431), mais les différences entre ces trois derniers ne sont pas significatives. Pour l'effet lune, la moyenne de la réponse en pleine lune est significativement plus élevée (0,563) que celle de l'absence lune (0,451) (test de Newman-Keuls, $P < 0,05$).

Les moyennes de la réponse de 19h00, 20h00, 21h00, 5h00 et 6h00 (Tableau 1 groupe a) sont significativement plus élevées que celles des autres périodes. La réponse est maximale à 20h00 et nulle entre 2h00 et 3h00. Les trois premières heures après la tombée de la nuit et les deux qui précèdent l'aurore sont ainsi plus favorables à la réponse.

Tableau 1. Moyennes des scores de réponse au repasse de la Chouette-pêcheuse rousse en fonction des heures d'observation.

Heure	Moyenne des moyennes	Significativité (Newman-Keuls, $P < 0,05$) ¹
20h00	1,000	a
19h00	0,958	a
5h00	0,958	a
21h00	0,917	a
6h00	0,917	a
4h00	0,500	b
22h00	0,458	b
23h00	0,208	c
24h00	0,125	cd
1h00	0,042	cd
2h00	0,000	d
3h00	0,000	d

¹Les lettres a, b, c, cd et d indiquent que les moyennes qui possèdent des lettres différentes sont significativement différentes. Le groupe cd a une moyenne à la fois semblable à la moyenne disposant de la lettre c et à celles qui possèdent la lettre d.

En ce qui concerne l'effet de l'association saison–lune, la moyenne de la réponse vocale de la Chouette-pêcheuse rousse de la combinaison petite saison pluvieuse-

pleine lune, est significativement plus élevée (0,778) que celle de chacune des sept autres combinaisons (Tableau 2).

Tableau 2. Moyennes des scores de sensibilité au repasse de la Chouette-pêcheuse rousse en fonction de l’effet saison–lune.

Saison–lune	Moyenne des moyennes	Significativité ¹ (Newman-Keuls, <i>P</i> < 0.05)
Petite Saison des Pluies–Pleine Lune	0,778	a
Petite Saison des Pluies–Absence de Lune	0,528	b
Grande Saison des Pluies–Pleine Lune	0,528	b
Grande Saison des Pluies–Absence de Lune	0,472	b
Petite Saison Sèche–Pleine Lune	0,472	b
Petite Saison Sèche–Absence de Lune	0,444	b
Grande Saison Sèche–Pleine Lune	0,417	b
Grande Saison Sèche–Absence de Lune	0,417	b

¹Voir note au Tableau 1.

Discussion

Distribution et statut de conservation

Malgré les efforts déployés au cours de cette étude, la Chouette-pêcheuse rousse a été signalée sur une seule station d’écoute du PN d’Azagny. L’enregistrement utilisé pour cet étude (Chappuis 2000) a été effectué en captivité et certaines émissions vocales prises en captivité sont moins efficaces dans la nature. Cependant, il est connu que l’espèce est sensible à la repasse de sa vocalisation (H. Rainey comm. pers.), et l’absence de réponse vocale dans les différents habitats des 79 autres stations suggère qu’elle n’est pas présente sur ces stations. Selon les données de l’enquête sur la distribution passée de la Chouette-pêcheuse rousse, il a été signalé par une des personnes interrogées que la Chouette-pêcheuse rousse se faisait entendre très souvent sur trois autres de nos stations du PN d’Azagny dans le passé. Ainsi donc, le taux de présence confirme que l’espèce demeure rare avec une répartition locale. Selon BirdLife International (2004) et H. Rainey (comm. pers.), la Chouette-pêcheuse rousse n’est connue que dans cinq sites, qui sont le PN de Taï (Gartshore *et al.* 1995), les PN du Mont Péko et de la Marahoué (H. Rainey comm. pers.), le Centre de Recherche Ecologique de Lamto (Demey & Fishpool 2001) et le PN d’Azagny. Excepté ce dernier site, les quatre autres sites sont localisés dans les zones de forêt (primaire, perturbée ou galerie) à l’intérieur du pays, et il se pourrait que la distribution principale de la Chouette-pêcheuse rousse en Côte d’Ivoire ne soit pas dans la zone forestière côtière, mais plutôt dans celles de l’intérieur. En effet, bien qu’aucun suivi de la Chouette-pêcheuse rousse n’ait été effectué dans le PN d’Azagny

avant la présente étude, ce site a été répertorié comme abritant cette chouette, sans doute à cause du fait que la majeure partie de son habitat lui est favorable. En effet, les formations forestières marécageuses et les mangroves représentent les deux tiers de sa couverture végétale (Lauginie *et al.* 1996, OIPR 2006a) soit environ 12 934 ha. Le type d'habitat (forêt marécageuse) dans lequel les Chouettes-pêcheuse rousses ont été recensées dans cette étude fait partie de ses habitats préférés (Atkinson *et al.* 1994, Gartshore *et al.* 1995, Gatter 1997, Borrow & Demey 2001).

Au niveau de l'Afrique de l'Ouest, la Chouette-pêcheuse rousse a été observée en Sierra Léone, dans une zone de forêt dégradée (Allport *et al.* 1989), au Libéria, dans des zones de mangroves et de forêt (Colston & Curry-Lindahl 1986, Gatter 1997), et au Ghana, dans une forêt exploitée (Rainey *et al.* en prép.). Toutes ces observations ont été faites dans des habitats possédant un cours d'eau ou dans des endroits inondés.

L'effectif détecté dans le PN d'Azagny est très faible (cf. Atkinson *et al.* 1994, Gatter 1997, BirdLife International 2004). Le fait que la Chouette-pêcheuse rousse ait été généralement observée par couple dans les PN du Mont Péko et de la Marahoué (H. Rainey comm. pers.), et que trois individus aient été détectés dans le même endroit au PN d'Azagny, laisse penser qu'il pourrait s'agir d'un couple et d'un juvénile, ce que confirme l'observation d'un juvénile au même endroit.

Cette étude indique que la Chouette-pêcheuse rousse semble être très peu utilisée par la population locale aussi bien en alimentation, en médecine traditionnelle qu'en maraboutage. Ceci est sans doute lié à la perception de mauvais augure (symbole de sorcellerie et synonyme de mort) que 90 % de la population riveraine a pour les hiboux en général. Selon les données de l'enquête, la Chouette-pêcheuse rousse est faiblement menacée par la persécution humaine directe (braconnage et capture des jeunes pour l'élevage) en zone forestière côtière de Côte d'Ivoire. Ses facteurs de menace dans cette partie du pays, notamment dans le PN d'Azagny, seraient probablement la destruction de son habitat (déboisement, défrichements illégal) et la pollution des eaux (Lauginie *et al.* 1996, OIPR 2006a). En Côte d'Ivoire, la Chouette-pêcheuse rousse est affectée par l'utilisation croissante des produits chimiques pour la pêche par empoisonnement des cours d'eau en saison sèche (obs. pers.).

En se basant sur les résultats de cette étude et de Rainey *et al.* (H. Rainey comm. pers.), on peut dire que le statut de conservation En Danger de la Chouette-pêcheuse rousse se justifie. Ainsi des mesures de conservation appropriées doivent être prises pour la survie de cette espèce.

Sensibilité de la Chouette-pêcheuse rousse à la repasse de sa vocalisation

Les données de l'étude ont montré que la réponse de la Chouette-pêcheuse rousse est variable selon les saisons, la présence ou l'absence de lune et des heures d'observations. Ce comportement vocal est semblable à celui de la Chouette-pêcheuse de Pel *Scotopelia peli* dont l'activité vocale est plus intense en présence de la lune (König *et al.* 1999). Les tranches horaires dans lesquelles la réponse de la Chouette-pêcheuse rousse à sa vocalisation est meilleur sont les trois premières heures de la nuit

et les deux heures qui précèdent l'aurore (cf. Borrow & Demey 2001, Dowsett-Lemaire 2006).

Remerciements

Nous tenons à remercier très sincèrement l'ONG SOS-Forêts (son président Dr Wadja Mathieu Egnankou), tous ses partenaires (BirdLife International, CEPF, Darwin Initiative) et Dr Jeff Lincer (Raptor Research Foundation), pour leur appui sans faille et les aides matérielles et financières mises à notre disposition dans le cadre de cette étude. Nous remercions également les autorités de la SODEFOR et de l'OIPR, particulièrement les chefs et le personnel des secteurs de nos sites d'étude qui ont favorisé notre accès aux différents sites. Nos remerciements vont également à Ron Demey, Michel Louette (Muséum d'Histoire Naturelle de Belgique), Lincoln Fishpool (BirdLife International) et David Johnson, (Global Owl Project), pour leur soutien et conseils. Une mention spéciale est accordée à toutes les populations des villages riverains des sites d'étude pour leur hospitalité et leur franche collaboration. J.M. Thiollay a relu et corrigé le manuscrit.

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A new breeding site of the Cape Verde Purple Heron *Ardea (purpurea) bournei* on Santiago, Cape Verde Islands

by D. Cesarini¹, A. Boughtflower² & A. Furtado³

¹Projecto “Áreas Protegidas”, Parque Natural Monte Gordo, São Nicolau, Cabo Verde.
<cosmoanarca@libero.it>

²Cobweb Cottage, Moor Lane, Sculthorpe, Fakenham, Norfolk NR21 9PY, U.K.
<aaronboughtflower@hotmail.com>

³Projecto “Áreas Protegidas”, Parque Natural Serra Malagueta, Santiago, Cabo Verde.
<amandiofurtado@hotmail.com>

Received 21 October 2007; revised 11 June 2008.

Summary

The Cape Verde Purple Heron *Ardea (purpurea) bournei* is endemic to the island of Santiago in the Cape Verde Islands where, until recently, it was known to breed at only one location. However, between June 2006 and February 2007, a small population was discovered and a single successful nesting attempt recorded at Serra Malagueta, Santiago Island, c. 18 km away from the known site. Notes on breeding behaviour are presented. *A. bournei* is considered critically endangered, due to increasingly arid conditions and loss of habitat. The new nest site is therefore considered important for its survival.

Resumo

Um novo local de nidificação da Garça vermelha de Cabo Verde *Ardea (purpurea) bournei* em Santiago, arquipélago de Cabo Verde. A Garça vermelha de Cabo Verde *Ardea (purpurea) bournei* é endémica da ilha de Santiago (arquipélago de Cabo Verde), até recentemente, apenas se conhecia um único local de nidificação. No entanto entre Junho de 2006 e Fevereiro de 2007, descobriu-se uma pequena população e registou-se uma tentativa bem sucedida de nidificação, em Serra Malagueta, ilha de Santiago, numa área que dista c. 18 km do sitio conhecido. Observações acerca do comportamento em época de nidificação, são apresentados. *A. bournei* é considerada em perigo crítico, devido ao aumento das condições de aridez e à perda do habitat. Por estas razões, a descoberta de um novo local de nidificação é considerada importante para a sua sobrevivência.

Introduction

The Cape Verde Purple Heron *Ardea (purpurea) bournei* is endemic to the island of Santiago in the Cape Verde Islands. It was first discovered in 1951, breeding at São Domingos (Bourne 1955). Another colony was discovered at Boa Entrada in the Santa Catarina region in March 1963 and later a single breeding attempt was reported at Trindade (Naurois 1966). Breeding at São Domingos ended during the 1970s, when trees used as nest sites were felled, leaving Boa Entrada as the sole remaining known nest site for the species. However, in 1991 a new colony was discovered at Banana in Ribeira Montanha (Hazevoet 1992), which subsequently became the only known breeding site when sightings at Boa Entrada became so scarce that Hazevoet (2003) considered this colony as abandoned. Despite Clarke (2006) asserting that breeding activity continued at this site, resident observers disagree, since individuals have been present only periodically in recent years, with no evidence to suggest that breeding has occurred (A. Randall pers. comm.). If so, the colony at Banana was the only breeding site known at the beginning of this study (June 2006), and the only site used consistently over the last 15 years. During the mid-1990s, the total population was thought to consist of *c.* 25 pairs or less (Hazevoet 1995). In recent years, censuses seem to show a consistently higher population, of around *c.* 60 pairs (A. Randall pers. comm.).

The Cape Verde Purple Heron breeds from mid-August to early March (Hazevoet 1995) and almost nothing is known of its ecology other than from observations at breeding sites. It is assumed that post-breeding dispersal into the interior of the island occurs (Hazevoet 1995) and, due to its discreet behaviour, observations during this period are few. Prior to 2006, records during the non-breeding season (late March to early August) included three juveniles collected at Pedra Badejo lagoon in April 1924 (Hazevoet 1992, 1995), and two observations in June 1993 at Ribeira Principal, of which the upper part is now inside the buffer zone of the Serra Malagueta Natural Park (SMNP) (Hazevoet 1995). However, the recent construction of a dam and reservoir not far from the Banana colony has resulted in many observations away from the breeding sites in 2006–7 (C.J. Hazevoet pers. comm.).

The Cape Verde Purple Heron was described as a new subspecies by Naurois (1966) and has been variously treated as subspecies or independent species since then. This has resulted in difficulties regarding its threat status. As a race of *A. purpurea*, it is designated as Least Concern (www.redlist.org, accessed 2007). However, as a full species it should be considered Critically Endangered and is so regarded nationally (Hazevoet 1996, 2003). Hereafter we refer to the Cape Verde Purple Heron as *A. (p.) bournei*.

Study Area

Most of the observations presented here are from the recently established SMNP (774 ha) and its buffer zone, in the northern interior of Santiago Island, which includes the

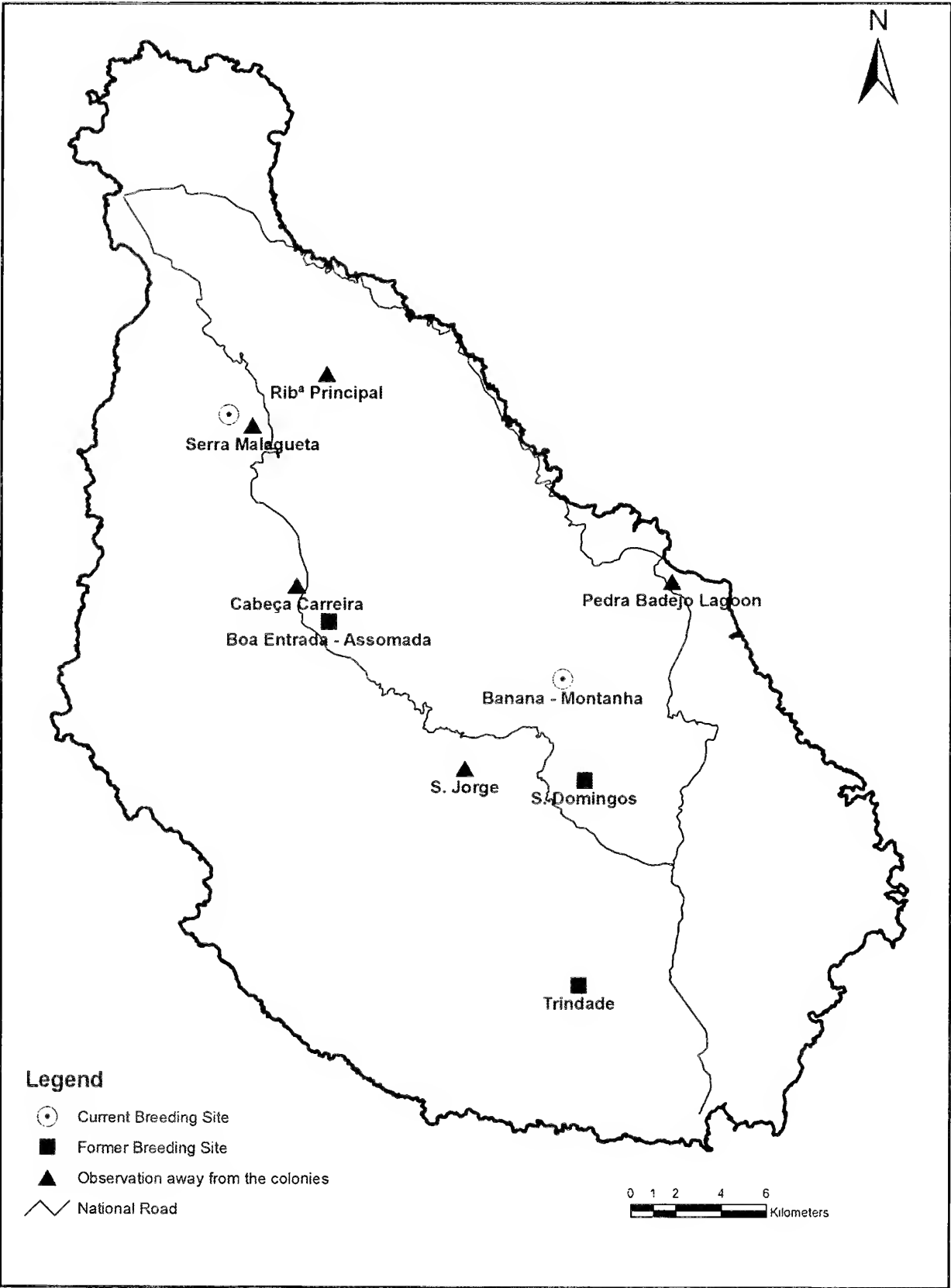


Figure 1. Santiago Island, showing the Serra Malagueta, former breeding sites at Sao Domingos, Boa Entrada and Trindade, and observations of *A. (p.) bournei* away from these locations.

upper part of the Homonymous mountain group (Fig. 1), with the second highest point of Santiago (1064 m). The area is characterised by steep relief with cliffs, rocky peaks and deep valleys. Geologically it is part of the Pico de Antonia eruptive complex, mainly composed of basaltic rocks.

The dry tropical environment of Cape Verde and local climatic conditions (in particular mist and fog which occur regularly throughout the year), together with the mountainous geography of the area, create a microclimate with slightly lower mean temperatures and slightly higher precipitation (annual mean 600 mm) than that of the rest of the island. These conditions result in a proliferation of vegetation, including many endemic species, particularly in northeastern exposed areas. The general environment of the SMNP is characterised by a core forested area (mainly *Eucalyptus* and *Pinus* spp.) and a surrounding mosaic of cultivated fields (mainly maize, beans and sweet potatoes) with uncultivated marginal areas, very small settlements and few scattered houses (Fig. 2). The rainy season (from July–August to October) is when many bird species breed.



Figure 2. Landscape in Serra Malagueta Natural Park.

Methods

As no surveys of the avifauna of the SMNP had been undertaken previously, surveys were carried out in order to establish which species were present. These surveys were

based on viewpoints, ground transects and night-time observations, to maximize the probability of counting all the species present. Casual observations and information from local people were also collected. From these preliminary data, specific research on individual species was designed.

Specific surveys for *A. (p.) bournei* were conducted between June 2006 and February 2007, in order to determine the status of its population and its distribution in relation to the boundaries of the SMNP. After finding the nest site, watches were made there at least once every two days for a minimum of two hours each over the period when the nest was being used. The time of day when watches were carried out was staggered on successive observation days. After the young fledged, watches were conducted less intensively but on a regular basis. Overnight stays were made when necessary. Observation was carried out from a distance using binoculars and telescopes. During other surveys in the SMNP, researchers were asked to note encounters with the species. Local people and other members of the project staff were also made aware of the bird's identification and asked to report any sightings.

Results

Table 1 summarises records away from the breeding site during the study period. These observations culminated in the identification of a breeding site at Ribeira Cuba (SMNP) on 11 Oct 2006. Ribeira Cuba is a steep sided valley formed by opposing vegetated cliff faces, c. 80 m apart, surrounded by steep slopes (Figs 3 & 4). Due to its elevation, the southern cliff face was in permanent shade (which may be a contributory factor in it being selected as a nest site), and characterised by more vegetation and pools of water retained in ledges. Semi-permanent pools also existed in the bottom of the narrow gorge at the base of the cliffs. The nest was positioned on the southern cliff, facing north and hidden by bushes of *Lantana camara* growing from the lower vertical face. It contained two young estimated to be around one week old.

The nest was made mostly of dry stem sections of *Hyptis pectinata*, possibly with a finer lining material, and both sexes fed the young by regurgitation. One chick was slightly larger and more dominant, indicating asynchronous hatching. The adult birds appeared particularly cautious when arriving at the nest, always making a few preliminary passes over the area before landing, and they consistently arrived from the same easterly direction. During the breeding period, adult birds were recorded away from the nest site on two occasions, each instance being east of the nest site (Table 1). It seems likely these sightings were of the parent birds.

The time when the juveniles left the nest is not known. The last observation of the young at the site was on 9 Nov 2006, by which time they were well developed and had previously been seen to fly a short distance. We assume they successfully fledged shortly after this observation. However, two additional immature birds were consistently seen to roost at the site (possibly offspring of the same adults from a previous



Figure 3. Cliff face in lower ribeira and nest site of *Ardea (p.) bournei*, in SMNP.

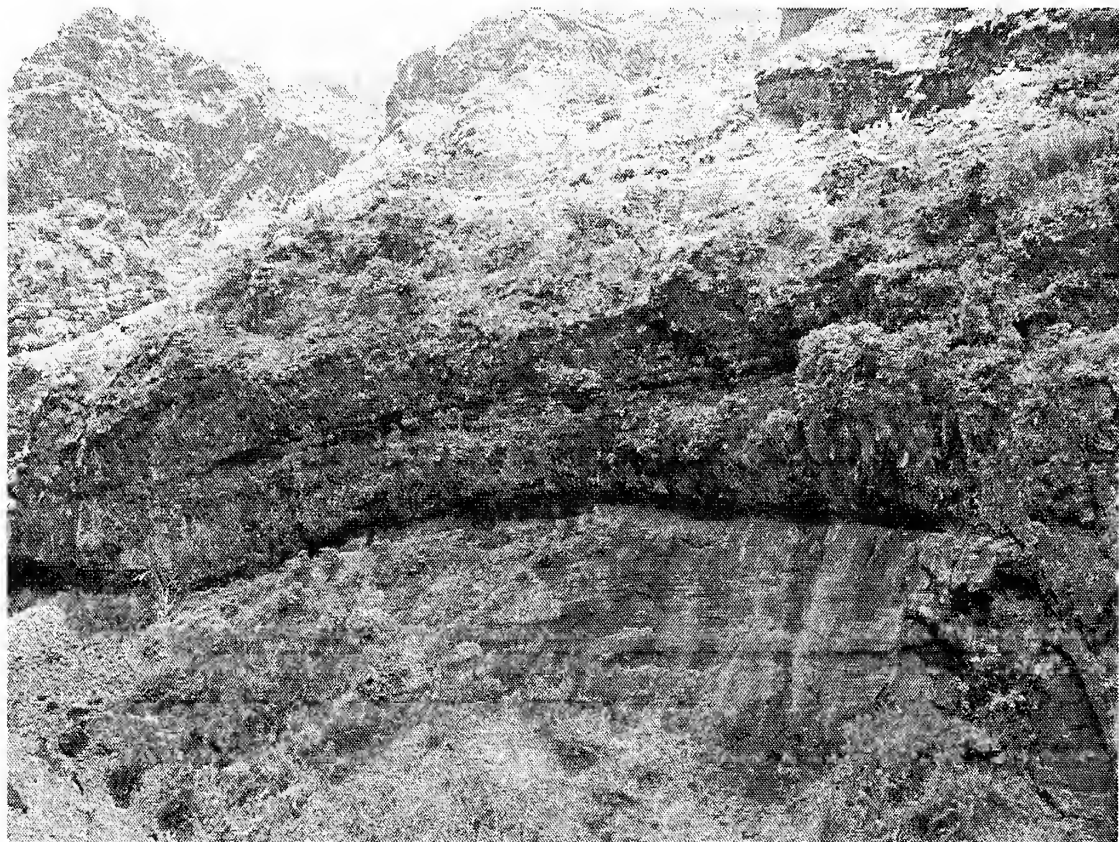


Figure 4. Ribeira containing nest site. Note the permanent shade afforded to the site.

Table 1. Records of *Ardea (p.) bournei* away from the breeding site during the study period.**Records prior to discovery of the nest site**

- 29 Jun 2006, Serra Malagueta (SMNP). A sub-adult on the highest (forested) ridge (1000 m a.s.l.) caught and ate a skink Scincidae.
- Early Jul 2006, Cabeça Carrera village. One flying high over the village, 7 km south of SMNP and c. 1.5 km from the former colony at Boa Entrada. The bird flew in almost a straight line between Serra Malagueta and Boa Entrada, although any connection between the sites is speculative.
- Early Jul 2006, Posto village (in SMNP). Identifiable remains, including tarsi and feathers, located. Enquiries confirmed the bird had been hunted and killed in the area, probably for food.
- 18 Jul 2006, Serra Malagueta (SMNP). A sub-adult seen foraging in the upper part (c. 1000 m a.s.l.), within sparse woodland of *Eucalyptus* sp.
- 24 Jul 2006, Posto village (in SMNP). One flying close to the village.
- 30 Aug 2006, Curral d'Asno (in SMNP). An adult landed in a cultivated field c. 200 m from the village (c. 600 m a.s.l.) and spent c. 30 min. foraging.
- 26 Sep 2006, Curral Velho (SMNP buffer zone). One flying around the village, c. 2.5 km north of the Serra Malagueta main ridge.
- 27–28 Sep 2006, Ribeira Cuba (SMNP). An immature present 18h00–9h00 (Fig. 5).

Records during presence of nestlings at the Ribeira Cuba nest

- 16 Oct 2006, Ribeira Cuba (SMNP). An adult flying from the direction of Ribeira Cuba, landed on a rock outcrop. It remained for 20 min. during which it preened and made a few strikes at prey before continuing to fly to the east. It was lost from view over the eastern limit of SMNP.
- 20 Oct 2006, Chan de Casa (SMNP). An adult flew from an area near the breeding site at Ribeira Cuba and landed in a maize field (c. 600 m a.s.l.).

Records after fledging

- 7 Dec 2006, Ribeira Gago (SMNP). One flying over a maize field (c. 500 m a.s.l.).
- 16 Jan 2007, Locotano village (on the border of SMNP). One flying over the village, apparently coming from the Ribeira Cuba breeding site towards the forested main ridge of Serra Malagueta.
- 16 Feb 2007, Kutelo de Barata (SMNP). One in flight over a cultivated area (< 1 km from the breeding site).
- 22 Feb 2007, Ribeira Cuba (SMNP). One adult and two sub-adults resting on a cliff c. 200 m from the breeding site. A fourth individual seen flying from Kutelo de Barata in the direction of the roost site.

breeding attempt) and it may be possible that the site was used as a roost site after this time. Similarly, while no evidence of a second breeding attempt was observed, four

subsequent sightings at the site (Table 1) suggest that breeding adults and their offspring may not abandon such areas completely.



Figure 5. Immature *Ardea (p.) bournei* at roost site in Ribeira Cuba (SMNP).

Discussion

Sightings of *A. (p.) bournei* foraging in the highest, isolated areas of SMNP confirm that dry hill slopes and cultivated land are preferred feeding habitat (Bourne 1955, Naurois 1988, Hazevoet 1992, 1995) while the timing of the breeding attempt is within the period given by Hazevoet (1995). The environmental characteristics around the breeding site and particularly the presence of semi-permanent water nearby seem to confirm the preference of *A. (p.) bournei* for nesting in humid ribeiras.

Although the birds may be rather tolerant of human presence, as all former colonies were situated near villages (Hazevoet 1992), the breeding site in Serra Malagueta was located in one of the less frequented areas of SMNP and away from human habitation. Santiago has a relatively high human population density (238 inhabitants per km²: INE 2000), which is widespread in the countryside. Areas of

habitat fulfilling all the feeding and breeding requirements of this bird are few, so it is difficult to ascertain if this tolerance is optimal behaviour or a consequence of its severely restricted options. The isolated nest site at SMNP and cautious inspection flights of the adults when approaching the nest were certainly different from the breeding location at Banana, which is close to human habitation and at which birds seem particularly at ease in their surroundings (pers. obs.). While the substantial size of the colony at Banana may have afforded greater security, the abandonment of the colony at Boa Entrada due (probably) to human disturbance suggests that the species is not immune to such detrimental effects. We therefore suggest that *A. (p.) bournei* demonstrates adaptive tolerance of human presence, but may prefer to avoid it.

Although this is the first breeding record of *A. (p.) bournei* in Serra Malagueta, the species has been previously reported in the area in 1969 (Naurois 1988) and 1993 (in Ribeira Principal close to Serra Malagueta: Hazevoet 1995). Older inhabitants assert that Ribeira Cuba has been used by this bird for more than 15 years, when apparently the population was more abundant. Naurois (1988) suggested the possibility of a colony “in the north of Santiago”, and the discovery of a population in Serra Malagueta confirms this. Other as yet unknown breeding sites may become apparent, and could be detected from movements outside the breeding season, and the sighting of an individual flying from the centre of the island (Assomada/Boa Entrada) towards the north (Serra Malagueta) in early July (Table 2) should be explored further.

This study highlighted a lack of knowledge concerning the foraging areas of *A. (p.) bournei* during the breeding season. If the observation of 16 Oct 2006 (Table 1) concerned one of the parents, then adults may well forage at considerable distances from nest sites. The consistent arrival and departure of adults to and from the same direction indicates the existence of favoured foraging areas. An increased knowledge of the movements of *A. (p.) bournei* both outside and during the breeding season is essential for a greater understanding of its ecology and conservation needs, particularly in regard to the protection of its habitats.

Hazevoet (1995) cites increasing desiccation in Cape Verde when predicting a depressingly short future survival of *A. (p.) bournei*. Our study does little to belie this prediction. Although the impact of invasive introduced species on *A. (p.) bournei* is unknown, both Vervet Monkey *Cercopithecus aethiops* and rats *Rattus rattus* and *R. norvegicus* are present in SMNP and may cause detrimental effects. However, direct human pressures appear to be the most immediate threat, as the instance of an individual being hunted by a community located within a protected area illustrates. The taking of eggs and killing of herons are known to have occurred at other breeding sites (Naurois 1987, Hazevoet 1999, 2001, 2003). These illegal activities can only further hasten the demise of this heron. Shortly after the hunting incident, SMNP staff initiated a conservation awareness programme within local communities, with emphasis on the need to preserve endemic and endangered species and *A. (p.) bournei* in particular. Leaflets and posters were produced to disseminate the *Decreto-*

Regulamentar No. 7/2002 (concerning endangered species conservation) and visits to primary schools were made. Illegal hunting was one of the main issues in a cycle of community awareness meetings during October 2006. Practical measures regarding the monitoring and conservation of *A. (p.) bournei* within the SMNP were identified and are currently under evaluation for inclusion in a management plan. Crucially, even though the breeding site at Ribeira Cuba was not included inside the originally planned SMNP limits, the discovery of the breeding site and results of additional research in the area have led to its inclusion within the SMNP. This measure gives stronger legal protection to the nesting area, but will not be enough to safeguard this site unless the local population fully accepts the need for the conservation of the species.

Should *Ardea (p.) bournei* be recognised as a full species, a higher level of concern would be attributed to it both in Cape Verde and internationally. The future of birds like *A. (p.) bournei* may ultimately depend on taxonomic decisions, despite the fact that such reproductively isolated and distinct forms are of considerable evolutionary interest (Hazevoet 1992).

Acknowledgments

Fieldwork was undertaken as part of the UNDP/GEF Project “Áreas Protegidas”. We thank the supporting institutions of the “Áreas Protegidas” Project: the UNDP, the GEF and the Direcção-geral do Ambiente of the Environment and Agriculture Ministry of Cape Verde and in particular, the people responsible during the period 2005–7: Abdelkader Bensada, Maria Teresa Vera-Cruz, Emanuel Leão Carvalho, Ivone Lopes, José Levy, Edoardo Zandri. We also thank the project team at Serra Malagueta in 2006: Iacopo Forte, “Vadinho” Nelson Avelino, Paula Monteiro and Melanie Reed. Special thanks go to the local communities of the SMNP area and especially to José Antonio Tavares and Emanuel Victor Tavares. We also thank Aline Randall for sharing her knowledge of ecology and the status of this bird. Richard Porter, Andy Stoddart, Cornelis Hazevoet and Francesco Pezzo reviewed drafts of the manuscript for which we offer our appreciation.

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Some recent records of birds from Gashaka Gumti National Park and Ngel Nyaki, Nigeria, and the Gotel Mountains, Cameroon

by Roger Wilkinson

North of England Zoological Society, Chester Zoo, Chester CH2 1LH, U.K.
<r.wilkinson@chesterzoo.org>

Received 7 November 2007; revised 19 May 2008.

Summary

Notable ornithological observations made in January 2005 at Gashaka Gumti National Park and Ngel Nyaki, SE Nigeria, and in March 2007 at Gashaka Gumti NP and in adjacent Cameroon are presented, and other recent records reviewed. These records include a number of species not previously documented for these localities and additional records for uncommon to rare species in the region.

Résumé

Quelques notes récentes sur des oiseaux du Parc National Gashaka Gumti et de Ngel Nyaki, Nigeria, et des Monts Gotel, Cameroun. Des observations ornithologiques remarquables faites en janvier 2005 dans le PN Gashaka Gumti et à Ngel Nyaki, SE du Nigeria, et en mars 2007 au PN Gashaka Gumti ainsi qu'au Cameroun voisin sont présentées, et d'autres notes récentes passées en revue. Ces notes couvrent un certain nombre d'espèces qui n'avaient pas auparavant été documentées pour ces régions ainsi que de nouvelles observations pour des espèces peu communes à rares.

Introduction

Gashaka Gumti National Park is Nigeria's largest wildlife reserve and occupies nearly 7000 km² on the eastern edge of the country and to the north of the Mambilla Plateau. I visited Gashaka Gumti NP during 12–15 January 2005 and 8–19 March 2007. In 2005 I was based in the S sector of the park at the Kwano research centre of the Gashaka Primate Project. Kwano (7°20'N, 11°35'E, 583 m a.s.l.) is at the base of Chappal Tale (7°22'N, 11°36'E) c. 10 km east of Gashaka village. During my 2005 visit I also made a short visit to the nearby montane forest outside the park borders at

Ngel Nyaki (7°4'N, 11°4'E). Both Gashaka Gumti and Ngel Nyaki are assessed as Important Bird Areas (IBAs) and as such are priority sites for conservation (Fishpool & Evans 2001).

In 2007 I was again based at Kwano and together with a colleague, researchers and staff from the research centre undertook a nine-day circular expedition to climb via the River Gamgam to the summit of Chappal Waddi (7°1'N, 11°41'E) and trek along the E border of the park bounded by the Cameroon border, returning to Kwano via Chappal Delam (7°6'N, 11°52'E) and Chappal Hendu (7°21'N, 11°44'E). The trek was made to assess the activity by cattle herders and their intrusion into the remaining forest on the western edge of the park, and bird observations were constrained by time and mainly concentrated at several campsites. Overnight camp sites were dictated by availability of drinking water and on one night necessitated camping in the Gotel Mountains of Cameroon. Gashaka Gumti NP and Ngel Nyaki, with some important localities and key topographic features, are illustrated in Fig. 1. Green (1990) provides a map of the park indicating some of these locations.

The more notable observations, including those of birds listed as rare or uncommon by Green (1990), are discussed below. Previous studies on birds of this and nearby areas were conducted by Hall (1976, 1977), Ash *et al.* (1989) and Green (1990). A provisional list of birds in Gashaka Gumti NP and its surroundings was compiled by Dunn (1999). This list is not readily obtainable or fully documented and I have included notes on several species listed there but missing from Green (1990). Common and scientific names follow Borrow and Demey (2004). I also include some unpublished records kindly provided by R. Dowsett and F. Dowsett-Lemaire (*in litt.*), referred to below as RJD & FDL.

Results

Anatidae

Anas sparsa African Black Duck. Two ducks thought to be of this species were seen in flight along the upper reaches of the River Gamgam on 11 Mar 2007. The following day one was seen well on the water further upriver in the area of the R Gamgam headwater forest. The species was noted as uncommon in Gashaka Gumti NP by Green (1990) and was otherwise only known in Nigeria from the Mambilla Plateau (Elgood *et al.* 1994). RJD & FDL saw one on a stream near Beli (7°52'N, 10°58'E), 9 Mar 1988, some at Yelwa (7°4'N, 11°5'E) on 29 Mar 1988 and a pair just over the border near Jauro Masali, Cameroon (7°0'N, 11°40'E).

Accipitridae

Gypohierax angolensis Palm-nut Vulture. One seen between Kwano and the R Gamgam, 9 Mar 2007; one close to Kwano, 18 Mar 2007. Uncommon in the S sector of the park (Green 1990).

Gyps africanus African White-backed Vulture. Three near Kwano, 14 Jan 2005; one between Chappal Delam enclave and Mayo Jeram (7°15'N, 11°51'E), 15 Mar 2007.

RJD & FDL saw small numbers in and on the edge of Gashaka Gumti NP, from Ngel Nyake to Leinde Fadali (6°58'N, 11°36'E), Mar 1988. Not listed by Green (1970) but included by Dunn (1999).

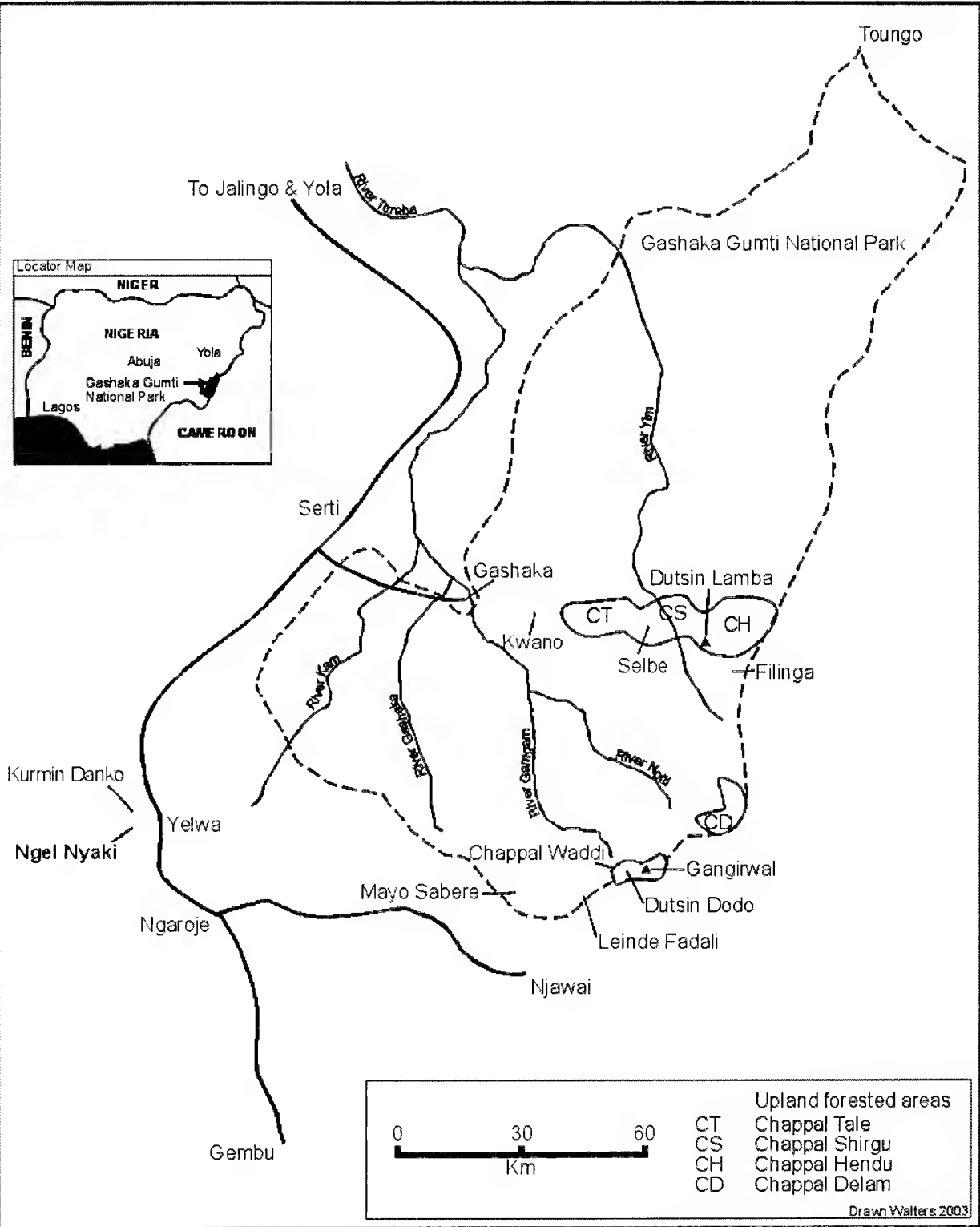


Fig 1. Gashaka Gumti National Park and neighbouring localities.

Gyps rueppelli Rueppell's Griffon. A total of nine seen in Mar 2007, one near the summit of Chappal Waddi, two in adjacent Cameroon, five on the Cameroon side of the NP and one between Selbe (7°22'N, 11°40'E, c. 1600 m a.s.l.) and Chappal Hendu. RJD & FDL noted it as common in Mar 1988, with dozens at Chappal Waddi and a group at Ngel Nyaki. Listed as uncommon by Green (1990) with seven noted on the N spur of Gangirwal (7°2'N, 11°42'E), Mar 1988.

Circus macrourus Pallid Harrier. One first-winter bird at Ngel Nyake, 16 Jan 2005. Listed as uncommon by Green (1990).

Circaetus beaudouini Beaudouin's Snake Eagle. One near Mayo Jeram, 15 Mar 2007. Listed as rare by Green (1990), at Mambilla and Gangirwal.

C. cinereus Brown Snake Eagle. One along the upper reaches of the R. Gamgam close to the headwater forest, 10 Mar 2007. Listed as rare by Green (1990).

Phasianidae

Ptilopachus petrosus Stone Partridge. Two on Chappal Waddi, 13 Mar 2007; a party of ten between Chappal Delam enclave and Mayo Jeram, 15 Mar; three between Selbe and Kwano, Mar 2007. The only previously known site in SE Nigeria was Serti (7°30'N, 11°22'E) (Hall 1977). Listed by Dunn (1999) but not by Green (1990).

Burhinidae

Burhinus senegalensis Senegal Thick-knee. Singles, 15 Jan 2005, 8 and 19 Mar 2007 on the river between Serti and Gashaka village. RJD & FDL recorded it at Serti, 10 Mar 1988. Not listed by Green (1990) but included by Dunn (1999).

Glareolidae

Cursorius temminckii Temminck's Courser. Seen at Ngel Nyaki, 16 Jan 2005. Recorded in Gashaka Gumti NP by Green (1990) only in Mar, when frequent.

Charadriidae

Vanellus senegallus African Wattled Lapwing. Two on top of Chappal Hendu, 16 Mar 2007. RJD & FDL saw some at Mayo Ndaga (6°55'N, 11°25'E), 27 Mar 1988. Only recorded Nov and Dec by Green (1990).

Columbidae

Treron calvus African Green Pigeon. Five observations with a total of 11 birds seen in four areas of the park and in an adjacent area in Cameroon, 13–19 Mar 2007. Listed as rare (as *Treron australis*) by Green (1990).

Musophagidae

Tauraco leucolophus White-crested Touraco. Two at Ngel Nyaki, 16 Jan 2005. Recorded at Yelwa by Hall (1976) and for Gashaka Gumti by Green (1990). Included by Ezealor (2001) for the Ngel Nyaki IBA.

Cuculidae

Chrysococcyx cupreus African Emerald Cuckoo. Heard near Kwano, 9 and 19 Mar 2007. Not listed by Green (1990) but included by Dunn (1999).

Strigidae

Strix woodfordii African Wood Owl. One heard in the Gamgam headwater forest, 11 Mar 2007. Listed as rare by Green (1990).

Apodidae

Tachymarptis aequatorialis Mottled Swift. Two at Tonga (7°21'N, 11°36'E, c. 1000 m a.s.l.), 13 Mar 2005; one at Gangirwal, 12–13 Mar 2007. Included as common by Green (1990), although Ash *et al.* (1989) indicated uncertainty over the identity of swifts in this area. However, RJD & FDL found it numerous in the highlands of the area.

Meropidae

Merops gularis Black Bee-eater. A pair watched closely at our camp site (7°12'N, 11°50'E, c. 1300 m a.s.l.) near the river, near Jeram enclave, 15–16 Mar 2007. In addition to their iridescent blue rumps and blue-streaked underparts these birds had a thin blue line above the bill, which distinguishes the eastern subspecies *M. g. australis*. Only *M. g. gularis* is listed for Nigeria by Elgood *et al.* (1994) and Borrow & Demey (1994), but these authors overlooked Fry (1984) who indicated that the distribution of *australis* extends west into S Nigeria to about Cross River. However some caution may be required as birds in SE Nigeria may show characters of both these subspecies (Fry *et al.* 1994).

Bucerotidae

Tockus fasciatus African Pied Hornbill. One between Kwano and Tonga, 13 Jan 2005; at Kwano, eight on 14 Jan 2005, one on 8 Mar 2007, two on 19 Mar 2007; six between Kwano and Gashaka, 19 Mar 2007. All were *T. f. fasciatus*, as indicated by the outer tail feathers being white along their whole length and the bill tip dark red. Listed as rare by Green (1990) with only one bird on the upper Yim in Feb.

Capitonidae

Lybius bidentatus Double-toothed Barbet. Two at Ngel Nyaki, 16 Jan 2005. Up to two at Mayo Jeram, 15–16 Mar 2007. RJD & FDL saw it in several places from Ngel Nyaki across to Chappal Waddi. Noted as uncommon to rare by Green (1990).

Picidae

Campethera nivosa Buff-spotted Woodpecker. One between Kwano and the R. Gamgam, 9 Mar 2007. Listed as rare by Green (1990).

Dendropicos poecilolaemus Speckle-breasted Woodpecker. Two at Gashaka, 15 Jan 2005. Listed as rare by Green (1990). Not included by Ezealor (2001) for Gashaka Gumti or Ngel Nyaki IBAs.

D. fuscescens Cardinal Woodpecker. One female at Mayo Jeram, 15 Mar 2007. RJD & FDL saw this species at Chappal Waddi and Gangirwal (7°2'N, 11°42'E) and at Jauri Masali in nearby Cameroon. Listed as uncommon to rare by Green (1990).

Alaudidae

Mirafraga africana Rufous-naped Lark. Two at Ngel Nyaki, 16 Jan 2005. Listed by Green (1990) only for Mar. Locally common on the Mambilla plateau with a few on Gangirwal and Chappal Wadi, Mar (Ash *et al.* 1989).

Hirundinidae

Hirundo daurica Red-rumped Swallow. Three at Mayo Jeram, 15 Mar 2007. Listed by Green (1990) as rare.

[*Psalidoprocne fuliginosa* Mountain Saw-wing. Swallows matching this species and lacking the whitish under-wing coverts of Petit's Black Saw-wing *P. pristoptera petiti*

or long tail streamers of Fanti Saw-wing *P. obscura* were seen on four occasions in 2007: a flock of *c.* 10 over the Gamgam headwater forest, 10 Mar; several in the Gotel Mountains close to the Cameroon border, 14 Mar (together with longer-tailed all-dark swallows considered to be Fanti Saw-wings); near Mayo Jeram, 16 Mar; at Chappal Hendu, 17 Mar. Ash *et al.* (1989) noted Mountain Saw-wing at Obodu and the species is included for Gashaka Gumti by Dunn (1999) and Ezealor (2001). Green (1990) notes only Petit's Black Saw-wing and Fanti Saw-wing as abundant to common at high elevations on Gangirwal and Sabere. RJD & FDL saw only Petit's Black Saw-wings at Gashaka Gumti in Mar 1988 and question the presence of Fanti Saw-wings at high altitude. The records of Mountain Saw-wing require confirmation, as confusion with immature Petit's remains possible.]

Motacillidae

Motacilla clara Mountain Wagtail. Ten seen along the Gamgam and the river at Kwano, Mar 2007. RJD & FDL noted it in the Chappal Waddi/Jauro Masali area. Included by Dunn (1990) but not Green (1990) who only lists African Pied Wagtail *M. aguimp* (as *M. alba*).

Pycnonotidae

Andropadus gracilis Little Grey Greenbul. Two at Kwano, 14 Jan 2005. RJD & FDL recorded it at Leinde Fatali. Not listed by Green (1990) but included by Dunn (1999).

Baeopogon indicator Honeyguide Greenbul. One at our camp site (ca 7°2'N, 11°45'E, *c.* 1400 m a.s.l.) in gallery forest in the Gotel Mountains in Cameroon. Not listed for Gashaka Gumti NP by Green (1990) but listed by Dunn (1990) and included in Ezealor (2001).

Turdidae

Cossypha albicapilla White-crowned Robin Chat. Two at Ngel Nyaki, 16 Jan 2005. Included by Ezealor (2001) for Gashaka Gumti but not for Ngel Nyaki.

Sylviidae

Hypergerus atriceps Oriole Warbler. One at Ngel Nyaki, 16 Jan 2005. Hall (1976) found small numbers near Yelwa. Not listed by Green (1990) but included by Ezealor (2001) for both Gashaka Gumti and Ngel Nyaki.

[*Macrosphenus concolor* Grey Longbill. Two birds fitting the description of this species were seen in deep forest at Kwano, 18 Mar 2007. Not listed by Green (1990) or Dunn (1999) but included for Gashaka Gumti by Ezealor (2001).

Schistolais leucopogon White-chinned Prinia. One at Mayo Jeram, 16 Mar 2007. Recorded in Gashaka Gumti NP, 28 Feb 1987 (Demey *et al.* 2003). Not listed by Green (1990) but included by Dunn (1999).

Apalis pulchra Black-collared Apalis. One in the Gotel Mountains, in Cameroon, 13 Mar 2007. Noted as common on the Nigerian side of the border on Gangirwal and Chappal Waddi by Ash *et al.* (1989). Listed for Gashaka Gumti by Green (1990) and Dunn (1999).

Cisticola chubbi Chubb's Cisticola. Seen on Gangirwal and Chappal Waddi, 12–13 Mar 2007. Listed (as *C. hunteri*) by Green (1990).

Muscicapidae

Muscicapa cassini Cassin's Flycatcher. Two on the upper reaches of the Gamgam River, 10 Mar 2007. Not listed by Green (1990) but included by Dunn (1999) and Ezealor (2001) for Gashaka Gumti.

M. sethsmithi Yellow-footed Flycatcher. One at our gallery forest camp site (7°2'N, 11°45'E) in the Gotel Mountains, Cameroon, 13 Mar 2007. Not listed by Green (1990) or Ezealor (2001) for Gashaka Gumti but listed by Dunn (1990). Recorded at Ngel Nyake, 29 Mar 1998 (Ash *et al.* 1989, RJD & FDL).

Myioparus plumbeus Lead-coloured Flycatcher. Two at Mayo Jeram, 15 Mar 2007. Considered rare in Gashaka Gumti by Green (1990) and noted just inside it by Ash *et al.* (1989).

Ficedula hypoleuca European Pied Flycatcher. Two at Ngel Nyaki, 16 Jan 2005; one between Jeram and Chappal Hendu, 16 Mar 2007. Listed by Green (1990) as common in Mar, rare Nov–Dec and unrecorded in other months.

Timaliidae

Illadopsis puveli Puvel's Illadopsis. An adult feeding a fledgling, between Chappal Hendu and Kwano, 17 Mar 2007 is the first breeding record for Nigeria and the second anywhere (Elgood *et al.* 1994, Salewski 1997). One netted at Ngel Nyaki, 2 Apr 1995 (Robertson 1995). Not listed for Gashaka Gumti by Green (1990) but included by Dunn (1999) and Ezealor (2001).

Nectariniidae

Hedidypna collaris Collared Sunbird. One at R. Gamgam headwater forest, 12 Mar 2007. Not listed by Green (1990) but included by Dunn (1999).

Laniidae

Tchagra australis Brown-crowned Tchagra. One between Kwano and Tonga, 13 Jan 2005. Green (1990) records it as rare.

Sturnidae

Onychognathus neumanni Neumann's Starling. Seen on Gangirwal, Chappal Waddi and further north in the mountains bordering Cameroon, Mar 2007. Recently split from *O. morio*, which was listed by Green (1990) and Dunn (1999).

Ploceidae

Ploceus baglafecht Baglafecht Weaver. One at Ngel Nyaki, 16 Jan 2005. Recorded by Hall (1976) at Nguroje, Gembu and Yelwa.

P. insignis Brown-capped Weaver. An adult male in the Gotel Mountains, Cameroon, 13 Mar 2007. Listed as common on Chappal Waddi by Green (1990).

Euplectes harilaubi Marsh Widowbird. Some 20 males in eclipse plumage at Ngel Nyaki, 16 Jan 2005, a new locality for this species. First recorded in Nigeria in 1988 on the Mambilla Plateau (Ash *et al.* 1989, Elgood *et al.* 1994).

Estrildidae

Nesocharis shelleyi Shelley's Oliveback. One at its nest at Ngel Nyaki, 16 Jan 2005. One at Ngel Nyaki, 1 Apr 1995 (Robertson 1995) and listed for Ngel Nyaki and Gashaka Gumti IBAs by Ezealor (2001). No previous breeding records in Nigeria and

only otherwise recorded from the edge of montane forest at Obodu Plateau (Elgood *et al.* 1994).

Estrilda nonnula Black-crowned Waxbill Two at Ngel Nyaki, 16 Jan 2005. Four in a patch of riverine forest in the Gotel Mountains, Cameroon, 13 Mar 2007.

Viduidae

[*Vidua camerunensis* Cameroon Indigobird. An adult male with dull blue plumage, a pale wing panel and pale whitish legs and bill, 13 Jan 2005, best fits this species. Not recorded by Green (1990) or Dunn (1999), but Payne (1994) thought it likely to be found in Nigeria. All four known foster species (Black-bellied Firefinch *Lagonisticta rara*, Blue-billed Firefinch *L. rubricata*, Brown Twispot *Clytospiza monteiri* and Dybowski's Twispot *C. dybowskii*) occur in the park (Green 1990). Requires confirmation, as it would be a new species for Nigeria (Elgood *et al.* 1994) and identification on sight alone may not be reliable (RJD & FDL).]

V. interjecta Exclamatory Paradise Whydah. Adult males observed on four occasions at Gashaka, Kwano and Tonga, Jan 2005. One adult male at Mayo Jeram, 15 Mar 2007. Not recorded by Green (1990) or Dunn (1999) but included for the Gashaka Gumti IBA by Ezealor (2001).

Fringillidae

Linurgus olivaceus Oriole Finch. Four with a party of Black-crowned Waxbills, feeding on small figs in a patch of riverine forest in the Gotel Mountains, Cameroon, 13 Mar 2007. Recorded by Ash *et al.* (1989) on Chappal Waddi and Gangirwal in Gashaka Gumti, and at Ngel Nyaki.

Acknowledgments

I am grateful to Mallam Mudu Sherrif and Mr Okeyoyin Agboola, successive Directors of Gashaka Gumti NP for welcoming my visit, to Prof. Volker Sommer and his colleagues from the Gashaka Primate Project for their hospitality at Kwano and to Dr Hazel Chapman for hosting my visit to Ngel Nyaki. Jerome Ihuma accompanied me in the field at Ngel Nyaki and showed me White-cheeked Touracos. Mark Pilgrim accompanied me on both visits. James Higham alerted me to the presence of Exclamatory Paradise Whydahs near Gashaka. Arthur Green and Bob Dowsett made valuable comments on the manuscript and I am indebted to them and to Bob Dowsett and François Dowsett-Lemaire for their additional observations. Volker Sommer provided coordinates and elevations for some sites. Dr Hazel Chapman kindly provided and gave permission to use the map in Fig 1.

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Short Notes — Notes Courtes

The first record of Short-eared Owl *Asio flammeus* in SW Cameroon

The Short-eared Owl *Asio flammeus* is a cosmopolitan species, breeding in the Holarctic and Neotropic regions. It is partially migratory, especially in the northern part of its range (Hoyo *et al.* 1999). European Short-eared Owls winter mainly in the northern Afrotropics (Cramp 1985), but small numbers cross the Sahara to Mali, Sudan, Ethiopia, and irregularly to Somalia and Kenya (Moreau 1972, Lamarche 1980, Britton 1982). Other records are known from Mauritania (Gee 1984, Lamarche 1988), Senegal (Morel & Morel 1990, Rodwell *et al.* 1996, Sauvage & Rodwell 1998), The Gambia (Barlow *et al.* 1997), Guinea (Morel & Morel 1988), Liberia (Gatter 1997), Niger (Giraudoux *et al.* 1998) and Nigeria (Velmalala & Gustafsson 2003).

On 14 January 2008 (*c.* 10h00), we flushed a Short-eared Owl on a lava flow in the southern foothills of Mt Cameroon (SW Province, Cameroon, 4°13'0"N, 9°10'21"E, 100 m a.s.l.). The owl was hidden between lava stones and took off at *c.* 10 m distance. It had a wingspan of *c.* 1 m. The upperparts were buff with dark streaks, and with several dark stripes on the tail. The underparts were not seen well, but the underwings were very pale with dark wing tips and carpal patches. We did not notice ear tufts, and the eyes were bright yellow. The flight was slow and low, alternating wing beats with gliding. The owl disappeared between lava stones after a 40–50 m flight. We did not find any pellets in the area.

This species can be confused with Marsh Owl *A. capensis*, but the latter has dark upperparts and eyes (Borrow & Demey 2001). Such a misidentification was probably the case for supposed Short-eared Owl records in The Gambia (Gore 1981, Smalley 1983). Our observation was during daylight and at close range, which enabled us to determine the species correctly. The combination of pale upperparts with dark streaks and dark carpal patches excludes confusion with Barn Owl *Tyto alba* and African Grass Owl *T. capensis*. African Grass Owl (which has dark carpal patches) is only locally uncommon in the area (Borrow & Demey 2001, Dowsett-Lemaire 2001), and often inhabits grassy habitats near freshwater. There are no freshwater surfaces within several km of the lava flow; there is only the Atlantic coast and some freshwater streams springing near the beach. Furthermore, all of us have previous field experience with Short-eared Owl in Europe, while JR has experience with other African owl species including similar ones (Riegert *et al.* in press).

Mt Cameroon erupted in March 1999, when the forest and surrounding oil-palm plantations were fragmented by black lava flows (alcalic basalt), extending 6–7 km from the main crater. The lava flow is now experiencing a primary succession. Lava flow is similar open terrain to other habitats occupied by the species, while ssp. *A. f. galapagoensis* is well known to inhabit lava fields in the Galapagos Islands (Groot 1983).

To date, there is only one record of Short-eared Owl in Cameroon (Messemaker 2003): an individual found dead at Mare Mdawe in the far north (11°25'N, 14°34'E) in January 2001. Our record represents one of the southernmost winter occurrences of the species in Africa; similar to that where Short-eared Owl was seen in Liberia (Gatter 1997) and Kenya (Lewis & Pomeroy 1989). Records near the Cameroon border are known from N Nigeria near L Chad, where the species was seen four times (Elgood *et al.* 1994, Velmala & Gustafsson 2003); although some of these were considered doubtful (Elgood *et al.* 1994), the most recent one was supported by a photograph (see Velmala & Gustafsson 2003).

We wish to thank MSM (6007665801) and GAAV (IAA601410709) for financial support.

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Received 23 February 2008

Revised 6 May 2008

Jan Riegert¹, Marcin Antczak² & Drahomíra Fainová¹

¹Univ. of South Bohemia, Faculty of Science, Dept of Zoology,
Branišovská 31, 370 05 České Budějovice, Czech Republic

²Adam Mickiewicz Univ., Dept of Behavioural Ecology,
Umultowska 89, PL-61 614 Poznań, Poland

On the occurrence of the Alpine Swift *Apus melba* in Nigeria

The Alpine Swift *Apus melba* is a not uncommon to rare Palaearctic winter visitor to W Africa (Keith *et al.* 1988), whose winter distribution is not adequately known in the region (Borrow & Demey 2001). For Nigeria, the known distribution extends only to about 7° N. However, there are two records from Cameroon, at 4–5° N, close to the Nigerian border (Borrow & Demey 2001). Here, we add four observations of large flocks of Alpine Swifts from the Cross River National Park, in SE Nigeria, suggesting that the species may regularly winter in this region. Observations were part of an ornithological survey in the Okwangwo Division of the Cross River NP, conducted in the surroundings of Bashu Okpambe village (c. 6°6'N, 9°8'E) from 1 to 26 Nov 2006.

Our observations are as follows (with minimum number of birds recorded): two flocks, of 40 and 30 birds, 16 Nov; 50 birds, 20 Nov; five birds, 24 Nov. The first and

the third observations were made on hilltops (c. 200–300 m above sea level), whereas the others were of birds hunting over the village and its adjacent farmland. Identification of the species was based on size (considerably larger than the other swifts they were with, see below), the characteristic call (typical trilling call, well known to the authors from experience in central Europe), plumage characteristics (overall brown with a white throat patch and a large white patch on the belly; the two white patches separated by a smaller brown band) and flight (relatively slow wing beats compared to the smaller swifts). The larger flocks on 16 and 20 Nov also contained 1–5 Little Swifts *Apus affinis* and 1–5 Common or African Black Swifts *A. apus* or *A. barbatus*. As it has recently been suggested that the Alpine Swift may not actually breed in W Africa (Dowsett & Dowsett-Lemaire 2005), we assume that the observed birds were Palaearctic visitors from NW Africa or Europe. We do not know whether this species occurs in this region throughout the winter.

We are grateful to the Swedish Ornithological Society, Ångpanneföreningen and Mr A.P. Leventis for financing the survey, and Drs Phil Hall and Ulf Ottosson for helping with logistics. This is publication 20 from the A.P. Leventis Ornithological Institute.

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Received 14 February 2007

Revised 26 November 2007

Michael Tobler & Sara Naurin

Dept of Animal Ecology, Lund University, Ecology Building, 223 62 Lund, Sweden
<michael.tobler@zooekol.lu.se>, <sara.naurin@zooekol.lu.se>

African Barred Owlet *Glaucidium capense* new to Togo

Between 21h00 and 22h00 on 25 July 1989 I heard a series of calls noted as “drrrr-drrrr repeated many times” at Djodji (7°40'N, 0°35'E), Togo. The calls, often repeated during the hour I listened, were coming from the interior of thick secondary forest beside a track leading to the River Gban-Houa, also known as the River Wawa, where it acts as the border between Togo and Ghana. The forested area was populated with trees such as *Antiaris africana* and *Chlorophora excelsa*, but was patchy with some areas being logged. At the time I was unable to identify the memorable calls, which I

had not heard before nor since, and did not have access to C. Chappuis's recordings on vinyl records that had been available since 1978. However, after F. Dowsett-Lemaire and R.J. Dowsett (*in litt.* and Dowsett-Lemaire & Dowsett 2007) informed me that they had discovered that the African Barred Owlet *Glaucidium capense* was common and widespread in Ghana I realised that the calls which I had heard were identical to the second part of the vocalisation ("a series of quavering notes") of the African Barred Owlet *G. c. ethecopari* on CD7 of Chappuis (2000). This is the first record for Togo and the most eastern record for the W African population. Given the time that has elapsed since this record, confirmation of the species' occurrence in the country is desirable.

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Received 26 August 2006; revised 19 December 2007

R.A. Cheke

Natural Resources Institute, University of Greenwich at Medway, Central Avenue,
Chatham Maritime, Kent ME4 4TB, U.K. <r.a.cheke@greenwich.ac.uk>

A new record of the White-crowned Black Wheatear *Oenanthe leucopyga* for Nigeria

The White-crowned Black Wheatear *Oenanthe leucopyga* is a true desert bird, occupying habitat with minimal vegetation in pebbly and rocky areas, wadis, cliffs, lava fields, human dwellings, ruins and cemeteries, over N Africa, most of the Sahara, Arabia and the Middle East (Cramp 1988, Keith *et al.* 1992). Some individuals or populations make short-distance movements in winter and birds from NW Africa are believed to migrate south in winter (Keith *et al.* 1992).

Around 10h30 on 8 Oct 2007, we sighted a robust, mainly black wheatear in dense savanna in Yankari Game Reserve, Bauchi State, Nigeria (c. 9°45'N, 10°30'E). When first seen, it was perched in the lower branches of a tall shrub, almost facing us, such that we could not see its back or the underside of its tail. It showed a completely white cap, from forehead to nape, and the rest of the visible part of the body was black. The bird quickly flew away, when we glimpsed a flash of white in the lower body or tail.

We first thought the bird to be a White-fronted Black Chat *Myrmecocichla albifrons*, but it showed a more robust bill and body and less vertical posture, more typical of *Oenanthe*, besides the wholly white cap. Adult White-crowned Black Wheatear is the

only Palearctic *Oenanthe* with white cap, vent, lower back, under tail-coverts and underside of the tail, which may account for the white we saw when it flew away. Hooded Wheatear *O. monacha* has more extensive white on the underside, from breast to under tail-coverts. All characteristics we observed identify the bird as White-crowned Black Wheatear, with two previous records in N Nigeria, one from Malamfatori (13°37'N, 13°23'E) in Aug 1963, and another near Maiduguri (11°49'N, 13°9'E) undated (Elgood *et al.* 1994). Our record was c. 550 km from the first and 400 km from the latter. The habitat at Yankari is atypical for the species and our record likely represents a straggler.

This is report number 29 from the A.P. Leventis Ornithological Research Institute.

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Received 5 November 2007

Revised 30 January 2008

Fabio Olmos¹, Ulf Ottosson² & Talatu Tende²

¹Largo do Paissandu 100/4C, 01034-010 São Paulo, SP, Brazil <f-olmos@uol.com.br>

²A.P. Leventis Ornithological Research Institute, P.O. Box 13404, Jos, Nigeria

Concentration de Nauciers d'Afrique *Chelictinia riocourii* près de Niono, Mali

En janvier 2006, une mission d'éco-volontariat pour l'ONG Planète Urgence avait pour objectif de réaliser des comptages de l'avifaune dans la région de Niono, Mali, au bénéfice d'une association malienne, Groupe Nature.

Le 12 janvier 2006, JJG et C. Diop observent une concentration d'environ 200 Nauciers d'Afrique *Chelictinia riocourii* posés sur un *Acacia albida* près du pont de Molodo, village proche de Niono. Ils arrivaient en groupes dispersés. Le lendemain à 8h45, 191 individus étaient posés ou en vol dans le même secteur. Le 16 janvier, entre 17h30 et 18h12, près de Niono, 560 Nauciers partaient vraisemblablement vers un dortoir, en direction du nord-nord-ouest. Le 17, à partir de 17h00, un dortoir rassemblant 2480 oiseaux est découvert sur quelques grands *Eucalyptus camaldulensis* à l'extérieur des jardins de Niono (14°15'26''N, 5°59'96''W). Les eucalyptus, acacias et rôniers *Borassus* sp. sont brûlés par les fientes. L'odeur est forte.

Ce dortoir est connu et respecté par les riverains depuis plusieurs années. Les jardiniers de ce secteur confirment le rôle positif joué par ces oiseaux et cette reconnaissance devrait leur assurer encore de beaux jours dans la région. Un habitant du voisinage, M. Fofana, nous a dit que “dans ce quartier il n’y a pas une souris!”, que des chasseurs tuent les Nauciers mais que lui s’y oppose. Selon les jardiniers, les Nauciers restent à Niono “durant toute la période des grandes cultures et les cultures de décrue”, c’est-à-dire dès la fin des pluies et pendant toute la saison sèche.

Le 19 janvier, dans la même zone, un groupe très dense de Nauciers d’Afrique survolait la campagne près du dortoir, et se posait sur les baobabs et les acacias des environs. Les voisins proches nous apprennent que les criquets arrivent en nombre et que les Nauciers s’en nourrissent sans interruption. Il s’agissait du criquet arboricole *Anacridium melanorhodon* (M.S. Diop & L. Schmitt comm. pers.), une espèce mesurant 7–9 cm, qui se reproduit dans la zone sahélienne et se regroupe en essaims denses très localisés dans les acacias durant la saison sèche (novembre–février). Ces bandes se déplacent la nuit et changent quotidiennement de place, à la jonction des zones pastorales et des zones cultivées. L’intérêt du Naucier d’Afrique pour les criquets *Schistocerca gregaria* ou *Ornithacris cavroisi* est bien connu (Morel 1968, Baillon & Cormier 1992, Mullié *et al.* 1992), celui pour le criquet arboricole est moins documenté car l’espèce est plus discrète.

Ce rassemblement de Nauciers d’Afrique a lieu au même endroit tous les ans. Il semble que les Nauciers chassent dans toute la zone entre deux périodes de reproduction (ponte en mai–juin), soit entre octobre et avril. Cette période dépasse la période de passage des vols de criquets, quelle que soit l’espèce. Par contre, elle correspond aussi à la période des feux de brousse où le type de chasse des Nauciers permet des captures d’invertébrés et de rongeurs en abondance.

Lamarche (1980) a rapporté un rassemblement de 800 individus près de Mopti (Mali) en janvier–février et de 400 dans le sud mauritanien en novembre. Le dortoir décrit ici a été revisité le 11 déc 2006 par Strandberg & Olofsson (2007) qui ont estimés la population de Nauciers à 4500 individus. Il est cependant moins important que celui découvert par P. Pilard au Sénégal, de 16 000 individus en janvier 2007, puis de 3000–5500 en novembre 2007 et de 36 000 pendant la deuxième quinzaine de janvier 2008 (http://crecerellette.lpo.fr/actualites/actualites_bas.html, consulté mai 2008).

Remerciements à M. Gérard Morel pour son aide dans la recherche de documentation et à M. Cheikh Diop, ingénieur agronome, assistant de recherche et chargé de cours de mammalogie et d’ornithologie à l’IPR/IFRA (Université de Bamako).

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Reçu 26 mars 2007; revu 4 juin 2008.

J.J. Guitard¹ & P.A. Reynaud²

¹LPO, Quartier Dandarelet, 83460 Les Arcs/Argens, France. <guitard.jj@wanadoo.fr>

²IRD, Les Orteaux, 05700 Trescléoux, France. <pierre.reynaud@ird.fr>

Eastern Olivaceous Warbler *Hippolais pallida reiseri* wintering in the Senegal valley

The Eastern Olivaceous Warbler *Hippolais pallida* is a Palaearctic migrant to sub-Saharan Africa. However, due to the difficulty of identification of its subspecies *reiseri*, *laeneni*, *pallida* and *elaeica* in the field and the potential confusion with the Western Olivaceous Warbler *H. opaca* from which it was recently split (Helbig & Seibold 1999, Parkin *et al.* 2004, Ottosson *et al.* 2005), the exact non-breeding distribution of each subspecies remains largely unknown (Svensson 2001). The westernmost subspecies *H. p. reiseri* breeds from E Morocco to Tunisia. Southern populations of it are supposedly resident, but northern populations were suggested to migrate to Senegal, Niger and Nigeria (Svensson 2001).

On 21 Jan 2008, two *H. p. reiseri* were mist-netted at the Lake Bire Maoudou (15°7'40''N, 12°48'26''W) near Adabéré, Senegal. The birds were distinguished from *H. opaca* by their slightly concave bills and the colour pattern of the tail feathers (Fig. 1), and their morphometrics, especially bill length (Table 1). Due to the wide overlap of morphological characters (Svensson 2001) it is difficult to identify *H. pallida* to subspecies level when only two individuals are available. However, colour pattern of the tail, and locality, strongly suggested *H. p. reiseri* (Svensson 2001). In addition to the two mist-netted individuals, at least ten more birds were observed in *Acacia nilotica* trees surrounding the lake. All showed repeated downward flicking of the tail, which separates *H. pallida* from *H. opaca*, which does not move its tail in this way (Svensson 2001). Additionally, four of the observed birds were singing and the typical repetition of phrases distinguished their songs from that of *H. opaca* (Constantine & The Sound Approach 2006).

Table 1. Comparison of measurements of *H. p. reiseri* from this study with *H. p. reiseri* and *H. opaca* from various sources. Measurements were: wing to nearest 0.5 mm (method 3 in Svensson 1992); bill tip to skull, to nearest 0.1 mm; tarsus to nearest 0.1 mm (Fig. 18 in Svensson 1992); body mass to nearest 0.1 g. We do not know the exact method used by King for his unpublished data cited in Ottosson *et al.* 1992. Data are presented as mean (range, n).

	<i>H. p. reiseri</i> ¹	<i>H. p. reiseri</i>	<i>H. opaca</i>
Wing	65.0, 67.0	64.0 (59–68, 52) ²	67.7 (63–72, 71) ² male: 70.0 (64.5–74.0, 46) ³ female: 68.3 (63.5–71.5, 23) ³ 69.5 (64.0–73.0, 13) ⁴
Bill	15.7, 14.3		17.6 (16.4–18.9, 83) ³
Tarsus	20.1, 22.1	21.9 (20–24, 11) ²	22.1 (21.1–23.2, 20) ² 22.5 (21.0–24.2, 81) ³ 23.0 (21.5–27.5, 12) ⁴
Body mass	8.9, 9.4	9.7 (7.6–11.0, 52) ²	10.2 (8.5–12.5, 71) ² 12.3 (9.3–16.8) ⁴

¹This study, live birds, Senegal.
²King, unpubl. data in Ottosson *et al.* 2005, live birds, The Gambia.
³Svensson 2001, skins from various localities.
⁴Ottosson *et al.* 2005, live birds, Nigeria.

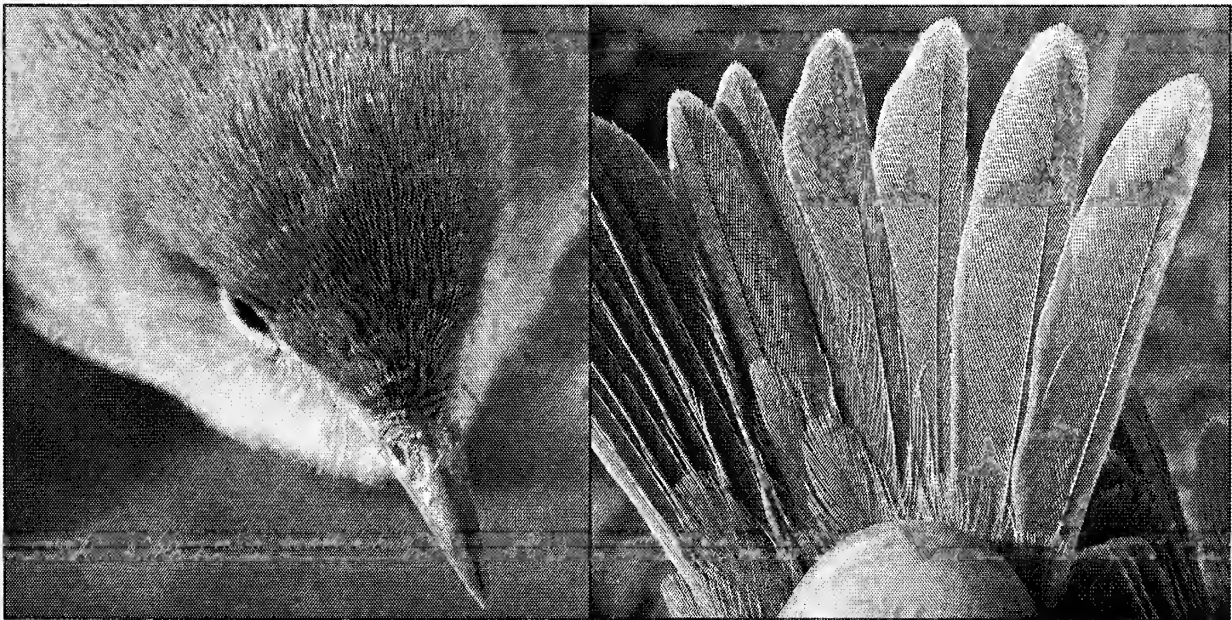


Figure 1. Head and tail of *Hippolais pallida reiseri*, Lake Bire Maoudou, Senegal, 21 Jan 2008.

H. p. reiseri is recorded from late August to early October and from mid-March to early May in central Mauritania, suggesting a migration to and from non-breeding areas further south (Salewski & Herremans 2006). In potential wintering areas, two specimens were recorded from Ndioum and Kidira, NE Senegal, by Morel & Roux (1966), but later judged as erroneous (Morel & Morel 1990). Two confirmed records are from Richard Toll from June and September 1986 (Morel & Morel 1990). Eight *H. p. reiseri* were mist-netted in Djoudj National Park between 1984 and 1994, mostly in October and November, but two in February and March (Rodwell *et al.* 1996). It is possible that most of these birds were on migration. However, one *H. p. reiseri* was mistnetted at Poste de Gainthe, Djoudj NP, on 22 Jan 2007 (Aquatic Warbler Conservation Team, unpubl. data) and another was observed at Mirador Président, Djoudj NP on 25 Jan 2007 (A. Le Nevé, pers. comm.). Lamarche (1981) mentions three captures of *H. p. reiseri* from Bamako, Mali, in December. On Jinack Island, Gambia, *H. p. reiseri* constituted less than 10% of "Olivaceous" Warblers ringed (Stoate 1998), but King (2000) records about 16 captured each year, compared to an average of 65 *H. opaca* per year, between 1994 and 2000. The observations described here suggest that the E Senegal valley is a potential stronghold of *H. p. reiseri* during the non-breeding season, and most support suggestions that the species tends to avoid coastal areas during migrating and winters mostly inland (Salewski & Herremans 2006, but see King 2000). The exact geographical limits of the non-breeding range of the subspecies remain to be investigated.

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Received 19 February 2008; revised 5 June 2008.

Volker Salewski

Max-Planck-Institute for Ornithology, Vogelwarte Radolfzell,
Schloßallee 2, 78315 Radolfzell, Germany

New White-necked Picathartes *Picathartes gymnocephalus* nesting areas in Ghana

White-necked Picathartes *Picathartes gymnocephalus* is a threatened endemic bird of the Upper Guinea Forest, occurring in five West African countries including Ghana. All known populations of the species are small and declining, with global population fragmented and estimated at less than 10,000 (Gatter 1997, Thompson 2007). The species is classified as Vulnerable by IUCN, and is wholly protected in Ghana under Schedule I of the Wildlife Conservation Regulation of 1971.

Rapid loss of lowland forests through logging and other forms of forest clearance are major threats confronting White-necked Picathartes in all range states (Thompson *et al.* 2004). Its specific habitat requirements render it highly vulnerable to habitat alteration and destruction. Although regularly recorded at certain sites in Ghana in the 1960s, (Grimes 1964, Grimes & Gardiner 1963, Grimes & Darku 1968) most of these sites are now degraded farmlands which are very unlikely to maintain any viable nesting sites. In 2003 Marks *et al.* (2004), recorded the species from Subim Forest Reserve, an area outside the previously known nesting areas, after nearly 40 years of no credible sighting. The Ghana Wildlife Society (GWS) has begun implementing a national action plan for the White-necked Picathartes, with a nationwide search carried out in 2005 to identify nesting sites of the species within the forests of Ghana.

Fifteen active nesting areas, with over 200 recently-used nests, were discovered in nine forest reserves (Ayum-Subim-Bonsam Bepo block, Worobong South, Southern Scarp, Nkrabea, Neung North, Afia Shelterbelt, Fum Headwaters, Onuem Nyamebe, Onuem Bepo) as well as others in off-reserve farmland areas in the Kwahu South District (Fig 1). These are mainly previously unknown nesting areas but Southern

Scarp was known to Grimes & Darku (1968). We also re-visited several nest sites in off-reserve areas in Kwahu-Tafo, Mpraeso and Aduamoah (all in Kwahu South District) that were mentioned by Grimes and Darku (1968) but of these only Aduamoah had two active nest sites. Two nest areas at Fumso in the Adansi North District of Ashanti Region, one in a farmland area and one in the Cocoa Research Institute of Ghana forest reserve, correspond with those reported by McArdle (1958), but neither had any active nest.

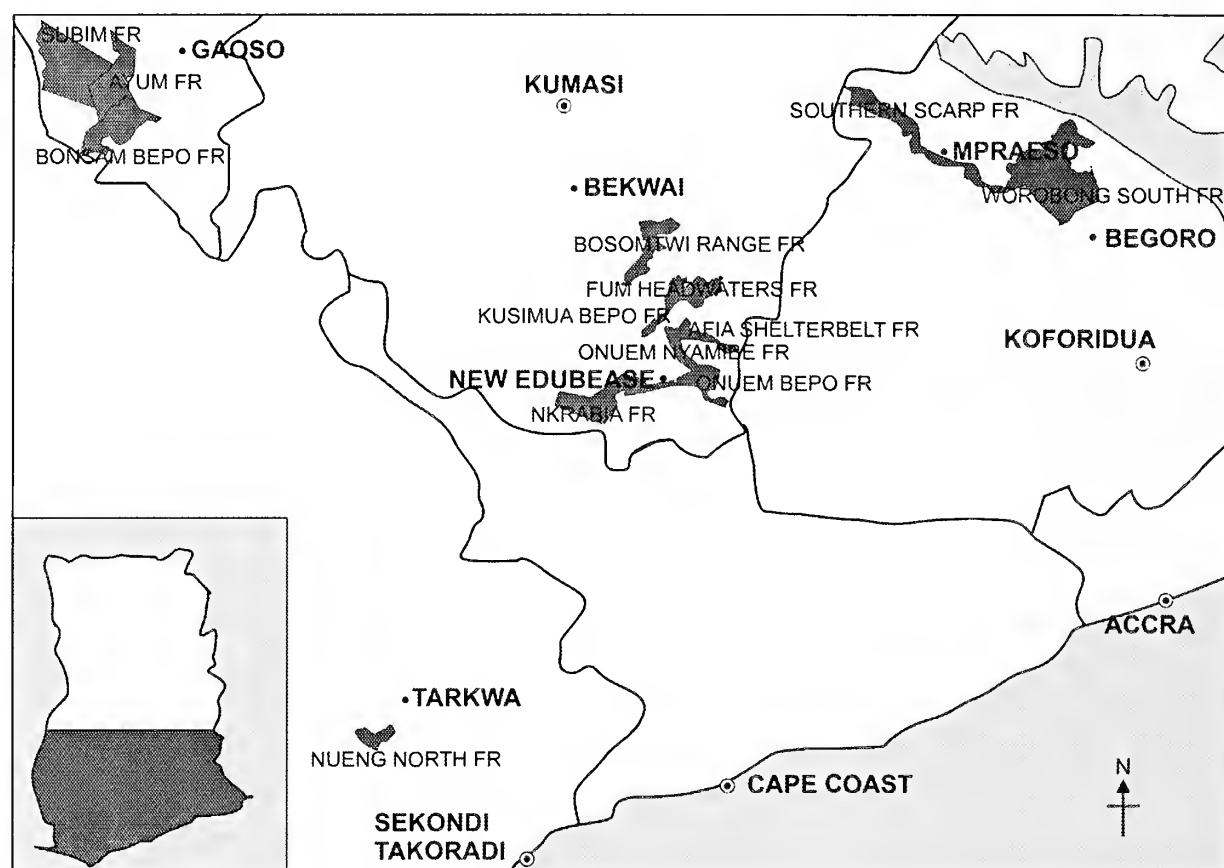


Figure 1. The high forest area of Ghana showing White-necked Picathartes nesting sites.

The Adansi South and North Districts in Ashanti Region hold five of the nine forest reserves (Nkrabea, Afia Shelterbelt, Fum Headwaters, Onuem Nyamebe, Onuem Bepe) and therefore constitute a major White-necked Picathartes breeding stronghold in Ghana. These five reserves hold over 120 active nests from about 25 nesting rock outcrops in nine nesting areas. The most important nesting areas include Breku (54 nests), Amanokrom (10), Ashlivi (8), Dotom Camp (29), Bogya (15) and Eshun (4), all in the Adansi North and South Districts.

The Adansi District nesting sites have already attracted international attention from bird watchers, with many visiting Bonkuro site in the Onuem Bepe FR since

February 2007. All visitors are accompanied by trained local guides who take care to ensure that they do not disturb the birds. There is a threat of logging in the future in parts of the reserve, including the compartment where the nests are located, which could potentially destroy the nests sites. However, the prospect for ecotourism provides a possible alternative income from these forests. GWS is therefore liaising with the Forest Services Division of the Forestry Commission of Ghana to exclude logging from at least the immediate vicinity of the nests, and is working with local communities to enhance the conservation and ecotourism potential of the sites.

The Critical Ecosystem Partnership Fund and the Royal Society for the Protection of Birds provided funding for some of the work described.

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Received 3 March 2008; revised 13 June 2008.

E.H. Owusu & A. Asamoah
Ghana Wildlife Society, Efua Sunderland Children Park, PO Box 13252, Accra, Ghana
<erasmus67@yahoo.com>

News & Letters — Nouvelles & Lettres

Meetings to set up a West African Bird Migration Network

Migrant birds that breed in Europe and winter in Africa are almost universally declining throughout Europe, in some cases by 80–90% over the last 30 years. Changing environmental conditions in African wintering or migration areas are suspected of being responsible but almost no research is being carried out in Africa to solve the problem.

Nineteen researchers met at the Vogelwarte Radolfzell on 6 May 2008 to discuss setting up a network to facilitate research on migrant birds in W Africa. The rationale for the network is the increasing concern for declining populations of migrants and changing conditions on migration or wintering grounds. Similar threats may be affecting intra-African migrants, yet there is almost no research within W Africa to identify the effects of changing conditions. Research is hampered by lack of capacity within many African countries. A research network that identifies, undertakes, promotes and coordinates research will help to address this problem. The Radolfzell meeting discussed the aim, structure and framework for activities of the potential network.

The primary aim is to investigate the role of environmental change in W Africa (initially, and across Africa eventually) on population limitation of migrant birds. This is to be achieved by facilitating research in Africa into how the distribution and density of migrant birds varies with environmental change. This aim will be addressed by the network acting as a centre for information about relevant research, by setting up a website, by regular meetings and by contacts via an e-mail list. Will Cresswell (St Andrews University) and Volker Salewski (Max-Planck-Institute of Ornithology) will act as coordinators for the first year. Actions will be to promote within W Africa:

- monitoring, using standardised protocols that the network will develop and a framework to link individual contributions into a coherent database;
- ringing, in cooperation with institutions like EURING and AFRING;
- coordinated stable isotope sampling to identify non-breeding areas;
- orientation experiments in the field to investigate time and directions of migrations;
- data management to facilitate sharing and dissemination of data;
- establishment of permanent field stations in a wide range of countries and habitats;
- greater awareness of the problems of anthropogenic effects on migrant birds.

The next meeting will take place during the Pan-African Ornithological Congress in South Africa in September 2008, where the aim will be to contact additional interested institutions and persons. It is hoped that the joint network will be officially launched then, with the cooperation of various African and European institutions.

Will Cresswell & Volker Salewski
<wrlc@st-and.ac.uk>, <salewski@orn.mpg.de>

Society Notices — Informations de la Société

W.A.O.S. membership changes Changements à la liste d'adhérents de la S.O.O.A.

New members — Nouveaux membres

AMES, A.R., Eagle Heights, Lullington Lane, Eynsford, Kent DA4 0JB, **U.K.**
 BIJLSMA, R., Doldersummerweg 7983, Wapse, **The Netherlands**
 DUFFY, M., 407 West 54th St YE, New York, NY 10015, **U.S.A.**
 RIDING, K., 5767 Holland St, Vancouver V6N 2A9, **Canada**
 VOADEN, N.J., 18 Fair Hill, Shipham, Winscombe, Somerset BA2 5TH, **U.K.**

Resignations and deletions — Renonciations et enlèvements

ADJAKPA, B.J.	JOHN, A.W.G.	SKEEN, R.Q.
BENNUN, L.	KENNEDY, E.	STONE, N.H.F.
BLACKWELL, K.	LAMARCHE, B.	TODD, A.J.
COCHRANE, J.M.	LAMOREUX, J.	WARR, Mrs F.E.
DE BONT, M.	LE GAL, P.Y.	
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Name and address corrections — Corrections de nom ou adresse

BROUWER, J., Wildekamp 32, 6721 JD Bennekom, **The Netherlands**
 ELLIOT, Sir C.C.H., Bt, Ph.D., 173 Woodstock Rd, Oxford, **U.K.**
 GUÉDON, G., 42 bis La Pommeraye, F-44480 Donges, **France**
 JONES, Dr P.J., Maud Lamb's Cottage, Fishmarket St, Thaxted, Essex CM6 2PQ, **U.K.**
 MASTERSON, A.N.B., [not Masterton], PO Box 2093, Harare, **Zimbabwe**
 OTTOSSON, Dr U., 18A Rue de Mamer, L-8280 Kehlen, **Luxembourg**
 RAINEY, H., W.C.S., PO Box 1620, Phnom Penh, **Cambodia**
 Bibliothécaire, LABO DE ZOOLOGIE, FACULTÉ DES SCIENCES, UNIVERSITÉ DE COCODY,
 22 BP582, Abidjan 22, **Ivory Coast**

Reinstatement and name change — Restauration et changement de nom

DOF [formerly D.A.F.I.F.], Lehmberg, T., Vesterbrogade 140, DK-1620 Copenhagen,
Denmark [Deleted in *Malimbus* 30: 92, 2008.]

R.E. Sharland

**West African Ornithological Society
Société d'Ornithologie de l'Ouest Africain**

Revenue Account for the year ended 31 December 2007

Income		<u>2006</u>
Subscriptions, donations and back numbers	£2046	£1659
Interest	<u>84</u>	<u>78</u>
	<u>£2130</u>	<u>£1737</u>
Expenditure		
<i>Malimbus</i> production and distribution	£2115	£2615
W.A.O.S. Research Grants	600	0
Scanning <i>Malimbus</i> for web site	<u>0</u>	<u>381</u>
	2715	2996
Deficit for year	<u>585</u>	<u>1259</u>
	<u>£2130</u>	<u>£1737</u>

Balance Sheet as at 31 December 2007

Assets		
Bank balances	£5121	5172
Less subscriptions paid in advance	<u>759</u>	<u>225</u>
	<u>4362</u>	<u>4947</u>
Accumulated funds		
Balance at 1 January	£4947	£6206
Less deficit for year	<u>585</u>	<u>1259</u>
	<u>£4362</u>	<u>£4947</u>

R.E. Sharland, Treasurer

I certify that I have verified the bank balances.

G.D. Field

Instructions aux Auteurs

Malimbus publie des articles de recherche, des revues de publications et des nouvelles traitant de l'ornithologie ouest-africaine.

Les **Articles** et les **Notes Courtes** doivent être des apports originaux; ceux déjà publiés ailleurs, en partie ou en totalité, seront normalement refusés. Les Notes Courtes sont des articles de moins de 1500 mots (références comprises) ou de quatre pages imprimées. Autant que possible, les manuscrits auront été au préalable soumis à au moins un ornithologue ou biologiste pour un examen minutieux. Les manuscrits seront envoyés pour critique à au moins un lecteur compétent.

Les textes des **Nouvelles & Lettres** ne devraient pas dépasser 1000 mots.

Les **textes** sont acceptés en anglais et en français; la Rédaction pourra aider les auteurs dont la langue maternelle n'est pas l'une de celles-ci. Nous préférons les envois de manuscrits par email (en pièce jointe). Consultez le Rédacteur pour plus de détails, par ex. les logiciels compatibles. Pour les envois sur papier, les textes seront tapés en deux exemplaires, d'un seul côté de la page, avec double interligne et larges marges.

Tous les Articles (mais non les Notes Courtes) comporteront un **Résumé**, n'excédant pas 5% de la longueur totale. Le Résumé mentionnera brièvement les principaux résultats et conclusions de l'Article et ne sera pas un simple compte rendu de ce qui a été fait. Les résumés seront publiés à la fois en anglais et en français et seront traduits au mieux par la Rédaction.

La **présentation** des tableaux, chiffres, unités métriques, références, *etc.* doit correspondre à celles des numéros récents. A notez, en particulier: les dates seront écrites "2 fév 1990" mais les mois seuls pourront être écrits en entier; les heures seront écrites "6h45", "17h00"; les coordonnées "7°46'N, 16°4'W" (pas de zéros en tête); les nombres jusqu'à dix seront écrits en toutes lettres, excepté devant une unité de mesure (ex. 6 m); les nombres à partir de 11 seront écrits en chiffres sauf au début d'une phrase. Toutes les références citées dans l'article, et aucune autre, doivent figurer dans la bibliographie.

Les **articles sur l'avifaune** doivent comprendre une carte ou un index géographique, incluant tous les endroits cités. Ils doivent comporter quelques brèves indications sur le climat, la topographie, la végétation et les circonstances ou événements inhabituels avant ou pendant l'étude (ex. pluies tardives, *etc.*). Les **listes d'espèces** ne doivent contenir que des données importantes: les listes complètes ne sont justifiées que pour les régions encore non étudiées ou délaissées pendant long-temps. Autrement, ne citer que les espèces sur lesquelles l'étude fournit une information nouvelle sur la répartition, la période de séjour, la reproduction, *etc.* Pour chaque espèce, indiquer l'extension de l'aire de répartition, une estimation d'abondance (*Malimbus* 17: 38) et les données datées sur la reproduction; indiquer le statut migratoire et la période de séjour seulement telles qu'elles ressortent de l'étude. Eventuellement, replacer les données dans le contexte en les comparant brièvement avec une liste régionale de référence. Les longues listes d'espèces peuvent être présentées sous la forme de tableaux (ex. *Malimbus* 25: 4–30, 24: 15–22, 23: 1–22, 1: 22–28, or 1: 49–54) ou sous la forme rédigée des numéros récents. La **séquence taxonomique** et les **noms scientifiques** (et de préférence aussi les **noms vernaculaires**) doivent suivre Borrow & Demey (2004, *Field Guide to the Birds of Western Africa*, Christopher Helm, London), ou Dowsett & Forbes-Watson (1993, *Checklist of Birds of the Afrotropical and Malagasy Regions*, Tauraco Press, Liège) ou The Birds of Africa (Brown *et al.* 1982, Urban *et al.* 1986, 1997, Fry *et al.* 1988, Keith *et al.* 1992, Fry & Keith 2000, 2004, Academic Press, London), à moins de donner les raisons de s'écarter de ces auteurs. Un **guide plus complet à l'intention aux auteurs** d'articles sur l'avifaune, comprenant l'échelle d'abondance des espèces conseillée, a été publié dans *Malimbus* 17: 35–39 et une version augmentée et actualisée de celle-ci mise sur le site Internet (<http://malimbus.free.fr/instmale.htm>). On peut en obtenir une copie de la Rédaction, qui se fera un plaisir de donner des conseils pour les études spécifiques.

Pour le dessin des **Figures**, et en particulier la taille des caractères, tenir compte des dimensions de la page de *Malimbus*. On préfère les figures préparées sur logiciel graphique approprié et sauvegardées en haute définition. Elles doivent être envoyées comme fichiers de logiciel graphique, et ne pas être incluses dans un fichier de Word. Les fichiers de basse résolution et les impressions de mauvaise qualité seront refusés. Les auteurs sont encouragés à soumettre des **photographies** qui illustrent des points importants de leurs articles. Les photographies doivent être bien contrastées et de haute définition (au moins 600 dpi). Elles doivent être envoyées comme fichier de logiciel graphique (par ex. jpg ou tif) et non pas être incluses dans un fichier de Word. Consulter le Rédacteur pour tout renseignement.

Un fichier pdf des Articles et des Notes Courtes, et une copie du numéro de publication seront envoyés gratis à l'auteur ou à l'auteur principal.



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